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ABSTRACT

This report on Compensatory Education (CE) documents the kinds, amounts, and costs of resources used in providing reading and mathematics instruction. A resource-cost model translated the measures of resource exposure into estimates of standard dollar costs for each student's instructional program. The overall strategy for estimating costs provided a dollar-metric that reflected the measures of individual resource exposure, accommodated interregional price differences, and was sensitive in discerning intraclassroom differences among instructional programs offered to students. The study found that the resource costs for CE students, particularly participants in Title I programs, were substantially higher than for non-CE students. Furthermore, differences in program costs were not affected by student characteristics (achievement status, teacher judgment of need for CE services, minority status, and participation in free or reduced price meals programs). (Author/JCD)

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RESOURCE ANALYSIS OF COMPENSATORY EDUCATION

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TECHNICAL REPORT #6 FROM THE STUDY OF THE SUSTAINING EFFECTS OF COMPENSATORY EDUCATION ON BASIC SKILLS

PREPARED FOR THE
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A PRECIS OF THE SUSTAINING EFFECTS STUDY AND AN OVERVIEW OF THE PRESENT VOLUME

THE SUSTAINING EFFECTS STUDY

In response to questions about education policies, SDC has studied compensatory education (CE); its nature, quantity, and environment; its sustained effects; and its generality, in a large study called: The Sustaining Effects Study. This thorough study will result in a series of reports from the following substudies.

The Longitudinal Study. In the Longitudinal Study, the educational achievements of children will be assessed in the fall and spring for three consecutive years. The children will take an achievement test in reading and mathematics, a functional literacy test, and a measure of attitude toward school and toward themselves as students. The amount and nature of instruction in reading and mathematics will be determined for each student four times during the school year. In addition, teachers and principals will report on their practices of instruction and teaching. Thus, it will be possible not only to assess student growth over a three-year period, but to relate this growth to the kinds and amounts of instruction being received.

The schools in the study were drawn from three different groups. The Representative Sample of schools is a sample carefully drawn to represent all of the nation's public schools having some of the grades one through six. A second group of schools, the Comparison Sample, is composed of schools that have large proportions of students from poor homes but do not receive special funds to offer CE services. The third group is the Nominated Sample, composed of schools nominated because their educational programs had promise of being effective for low-achieving students. During the first year of the study, data were collected from 328 schools and about 118,000 students.

The Cost/Effectiveness Study. Information is being obtained on the resources and services to which each student is exposed during reading and mathematics instruction. Cost estimates will be generated on the basis of this information. Because the effectiveness of the instructional programs is to be determined in the Longitudinal Study, it will then be possible to relate the effectiveness to the cost of each program.

The Participation Study. The purpose of the Participation Study, is to determine the relationships among economic status, educational need, and instructional services received. The educational achievement of the students and the services they receive will be obtained in the Longitudinal Study, but the refined measures of economic status will be obtained in the Participation Study. A random sample of over 15,000 students was drawn from the schools in the first-year Representative Sample and visits were made to the homes of these students. During the visits, information was collected on the economic level of the home and on the parents' attitudes toward their child's school and learning experiences. Thus, the level of student achievement and services received can be related to the economic level of the home from which the student comes.

The Summer Study. The Sustaining Effects Study also examines the effectiveness and cost-effectiveness of summer-school programs. RMC Research, responsible for conducting the summer study, is investigating questions about summer school. Information about the 1977 summer school experiences of the SES students is being combined with other SES data. The resource cost model, developed for the regular-year cost-effectiveness studies, is being adapted to the needs of the summer school study.

The Successful Sites Study. This study is to identify and describe the instructional practices and contexts that appear to be effective in raising the reading and math achievements of educationally disadvantaged students. In-depth observational and interview data will be collected from approximately 50 schools that are participating in the Sustaining Effects Study.

OVERVIEW OF THE PRESENT VOLUME

This is the sixth technical report in a series of reports emanating from the Study of the Sustaining Effects of Compensatory Education on Basic Skills.

The report documents the analysis of the kinds, amounts and costs of resources used in providing instruction in reading and mathematics. The students, enrolled in grades one through six, are identified as those receiving regular instruction or those selected to receive compensatory education services, funded either by the Title I program or by other compensatory education program sources.

The data for the analyses are provided by 3,500 teachers for the 80,000 students in the 242 schools that comprise the Representative Sample of the Sustaining Effects Study. The nature of the study and its instrumentation are described in Chapter 1.

The focal point of data collection and analysis is on the resources used in providing the instruction offered to elementary students. Resource exposure to instructional staff in different sized groups is measured at the student level for individual students, and at the classroom level when all students in the class share equally in the use of the classroom resources, such as classroom equipment. The result is a measure of the resource exposure for an individual student's instruction in reading and mathematics.

A resource cost model, designed for the study, translates the measures of resource exposure into estimates of dollar cost for an individual student's instructional program. The overall strategy for estimating cost is designed to provide a dollar-metric that reflects the measures of resource exposure, accommodates interregional price differences, and is sensitive in discerning intraclassroom differences among the instructional programs offered to students. The dollar-metric, expressed as standard resource dollars (SRD), permits cost comparisons among student instructional programs on an equitable basis. The approach to estimating cost and the resource cost model are discussed in Chapter 2.

These cost estimates provide the information needed in addressing those policy issues and their research questions where resources and costs are the variables of interest. The research questions – addressed in the resource analyses reported in Chapters 3 and 4 – fall within the areas dealing with the nature of compensatory education as it is currently implemented, and the differences between instructional services provided as compensatory education and as regular instruction. The student-level instructional programs for Title I students and for other compensatory education services are compared with the programs of students <u>not</u> selected for these services – students receiving only regular reading and mathematics instruction.

The results of our analyses are reported for those students who are selected to receive compensatory education and for those students who are receiving non-compensatory

education or regular instruction. Within the first two groups, selectee and non-selectee, the students are further categorized as:

- Selected for CE services
  - Title I students in Title I schools
  - Other-CE students in Title I schools
  - Other-CE students in Other-CE schools
- Not selected for CE services
  - Non-CE students in Title I schools
  - Non-CE students in Other-CE schools
  - Non-CE students in non-CE schools

Costs are presented as mean total program costs, expressed in our dollar-metric of standard resource dollars and, when appropriate to the analysis, as subtotals of the program cost. For example, we discuss the portion of the total cost attributable to the use of types of resources such as classroom teachers, special teachers, and equipment used individually or by groups of students. These are the resource cost variables. Another subtotal grouping of total cost is by program component, where the program component is the delivery configuration within which the student receives instruction. These are referred to as the program component cost variables.

In brief, the resource cost variables allow us to examine the resource mixture of the individual student's total program cost; the program component cost variables permit an examination of the total program cost in terms of the cost of the different delivery configurations used to provide instruction.

RESULTS OF THE RESOURCE ANALYSIS

The resource and cost data, along with student data, are used in analyses designed to provide information for addressing those policy issues in compensatory education where the amount and cost of resources is of interest. The analyses involve first determining the costs of the reading and mathematics programs offered to compensatory and to regular students and, second, investigating whether the two types of programs (compensatory and regular) differ in terms of the use of resources and their costs.

Program Cost and Student CE Selection Status. The data below summarize the basic program costs for reading and mathematics for each of the six categories of CE selection used in the SES. The program costs are shown in terms of total program cost separately in

Cost of Reading Programs Offered to ALL Grades by Student CE Selection Categories (in Standard Resource Dollars)

Reading Program Cost	Reading CE Selection Category											
	Title I Students in Title I Schools 9785 Students		Other-CE Students in Title I Schools 4349 Students		Other-CE Students in Other-CE Schools 3387 Students		Non-CE Students in Title I Schools 35781 Students		Non-CE Students in Other-CE Schools 18654 Students		Non-CE Students in Non-CE Schools 8046 Students	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	336	186	303	173	316	178	219	146	205	132	210	149
Instructional Support	17	22	7	10	10	14	3	7	3	7	2	7
Equipment and Materials	59	38	40	25	58	36	34	22	33	22	32	19
Reading Total Program Cost	411	202	350	184	384	188	257	154	242	140	244	155

Cost of Mathematics Programs Offered to ALL Grades by Student CE Selection Categories (in Standard Resource Dollars)

Mathematics Program Cost	Mathematics CE Selection Categories											
	Title I Students in Title I Schools 5296 Students		Other-CE Students in Title I Schools 3674 Students		Other-CE Students in Other-CE Schools 2233 Students		Non-CE Students in Title I Schools 41035 Students		Non-CE Students in Other-CE Schools 19711 Students		Non-CE Students in Non-CE Schools 8062 Students	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	194	118	155	96	172	87	124	81	113	65	129	101
Instructional Support	15	23	3	7	10	17	2	6	1	3	1	3
Equipment and Materials	32	23	21	13	32	25	20	14	18	12	19	11
Mathematics Total Program Cost	241	134	180	101	213	97	146	85	132	66	148	103

reading and in mathematics, and in terms of the subtotal cost for teaching personnel, instructional support, equipment and materials.

We begin with the observation that CE selectees, in general, are offered substantially higher resource levels – and hence more costly programs – than are non-CE students. The reading programs offered CE students cost, on the average, $391 as opposed to $251 for non-CE students, a difference of 56 percent. CE students' mathematics programs cost $215 and the mathematics programs of non-CE students cost $142, a difference of 51 percent. In both reading and mathematics, the CE group with the lowest average cost exceeds the highest cost for any of the non-CE groups. Title I students have the highest average reading cost over all categories. The Title I cost is 60 percent higher than that of non-CE students in Title I schools ($411 as compared to $257). The average cost of mathematics programs for Title I students is $241, as opposed to $146 for non-CE students in Title I schools, a difference of 65 percent. Again, Title I students show the highest average cost over all selection categories.

In our analysis of the subtotals of program cost, in both reading and mathematics, we note that teaching personnel account for similar percentages of total program cost among both CE and non-CE programs alike. Teaching personnel represent 82 percent to 86 percent of total reading program cost in the CE selectee categories and 85 to 86 percent in the non-CE categories. For mathematics programs, the values are 81 to 86 percent among CE selectee groups and 85 to 87 percent for the non-CE selectee groups.

PROGRAM COMPONENT COSTS AND STUDENT CE SELECTION STATUS

Although the differences in total program cost (reading and mathematics) between selectees and non-selectees are themselves substantial, we also note, as shown below, that the more impressive differences occur in specific components of total program cost, namely instruction by special teachers. In the two program components under the heading special teacher, 17.1 to 32.6 percent of the cost of their reading programs for selectees is for special teachers. For non-selectees, on the other hand, only 2.5 to 3.9 percent of their program costs are for instruction by special teachers. For mathematics, selectees receive 12.8 to 29.5 percent of their program costs in instruction by special teachers. The values for non-selectees are 2.0 to 4.1 percent.

Among CE selectees, Title I students exhibit both the generally highest average costs in reading and mathematics and the highest cost for special teachers. Nearly one-third of the program cost for Title I students is for special teachers. This indicates not only that Title I students are offered more resources, but also that they are offered more intensive exposure to instructional resources. Instruction by special teachers, as defined in this study, includes a measure of intensity as well as a measure of teacher qualities. Such instruction is provided by special teachers in each subject matter area and takes place in medium and small size groups.

CE Selection Status	READING				MATHEMATICS			
	Special Teacher Medium Group		Special Teacher Small Group		Special Teacher Medium Group		Special Teacher Small Group	
	$	Percent Total Cost	$	Percent Total Cost	$	Percent Total Cost	$	Percent Total Cost
Title I Students in Title I Schools	29	7.0	105	25.6	23	9.6	48	20.0
Other-CE Students in Title I Schools	10	2.9	50	14.3	3	1.7	20	11.1
Other-CE Students in Other-CE Schools	17	4.4	88	22.9	12	5.6	32	15.0
Non-CE Students in Title I Schools	2	3.1	8	2.0	2	1.4	4	2.7
Non-CE Students in Other-CE Schools	2	0.8	5	2.0	1	0.8	2	1.6
Non-CE Students in Non-CE Schools	2	0.8	6	2.4	1	0.7	2	1.4

By and large, these data provide convincing evidence that compensatory efforts have been quite successful in increasing the level of resources offered to students selected to participate in those programs.

PROGRAM COST AND STUDENT CHARACTERISTICS

Additional analyses were conducted to examine further the program cost data in relation to four student characteristics in addition to CE selection status. The purpose was to ascertain whether the differences in program cost among the six selection categories may be conditional upon those other student characteristics. The four characteristics are: student achievement status, teacher judgment of need for CE services, student minority status, and participation in free or reduced price meals programs. The general conclusion we reached is that *none of the student characteristics are as strongly related to program cost as is selection category.* None of the four student characteristics variables accounted for more than half of the amount of variation in program cost accounted for by selection category, and most accounted for far less.

As shown below, students who are lower achieving (at or below the 50th percentile in achievement), and students who are judged by their teachers to be in need of CE services, are offered higher resource levels than are higher achieving students and students whose teachers judge them not to be in need of CE services. Focusing on Title I students, those in

Cost of Reading Programs by Student Achievement Level, CE Selection Categories And Teacher Judgment of Need for CE Services – ALL GRADES (in Standard Resource Dollars)

School, Selection Category, Teacher Judgment	N	ACHIEVEMENT LEVEL: 50th Percentile or Below Mean	N	% of Total*	Above 50th Percentile Mean	N	% of Total*
TITLE I SCHOOLS							
Title I–Needed	8,549	421	7,395	76	445	1,154	12
Title I–Not Needed	1,154	334	786	8	284	368	4
Total	9,703						
Other-CE–Needed	2,469	395	2,026	47	369	443	10
Other-CE –Not Needed	1,835	314	861	20	283	974	23
Total	4,304						
Non-CE –Needed	8,875	291	6,754	19	292	2,301	7
Non-CE–Not Needed	26,486	258	9,008	26	240	17,478	49
Total	35,361						
OTHER-CE SCHOOLS							
Other-CE–Needed	2,502	389	2,105	63	430	397	12
Other-CE–Not Needed	837	366	463	14	329	374	11
Total	3,339						
Non-CE–Needed	3,072	270	2,190	12	259	882	5
Non-CE–Not Needed	15,361	249	4,255	23	232	11,106	60
Total	18,433						
NON-CE SCHOOLS							
Non-CE–Needed	2,073	298	1,623	20	261	450	6
Non-CE–Not Needed	5,889	247	1,999	25	218	3,890	49
Total	7,962						

*Percentage of total students in the selection category. (Rounded to nearest whole percentage.)

Cost of Mathematics Program by Student Achievement Level, CE Selection Categories And Teacher Judgment of Need for CE Services – ALL GRADES (in Standard Resource Dollars)

School, Selection Category, Teacher Judgment	N	ACHIEVEMENT LEVEL: 50th Percentile or Below Mean	N	% of Total*	Above 50th Percentile Mean	N	% of Total*
TITLE I SCHOOLS							
Title I–Needed	4,523	256	3,678	70	234	845	16
Title I–Not Needed	723	184	470	9	165	253	5
Total	5,246						
Other-CE–Needed	2,132	201	1,593	44	178	539	15
Other-CE–Not Needed	1,503	162	648	18	154	855	24
Total	3,635						
Non-CE–Needed	13,350	160	9,645	24	155	3,705	10
Non-CE–Not Needed	27,211	144	9,785	24	137	17,426	43
Total	40,561						
OTHER-CE SCHOOLS							
Other-CE–Needed	1,516	219	1,246	57	215	270	12
Other-CE–Not Needed	677	208	330	15	193	347	16
Total	2,193						
Non-CE–Needed	4,083	145	2,822	14	137	1,261	7
Non-CE–Not Needed	15,398	131	4,759	24	128	10,639	55
Total	19,481						
NON-CE SCHOOLS							
Non-CE–Needed	2,088	180	1,532	19	154	556	7
Non-CE–Not Needed	5,889	144	2,128	27	138	3,761	47
Total	7,977						

*Percentage of total students in the selection category.
(Rounded to nearest whole percentage.)

the lower half of the achievement distribution have slightly higher costs than those in the upper half of the achievement distribution. Title I students who need CE services (as judged by their teachers) have substantially higher reading costs ($424 vs. $318) and mathematics costs ($252 vs. $177) than do Title I students not judged to need CE services.

We also see that very few Title I selectees are both in the upper half of the achievement range and judged not to be in need of CE services (4 percent in reading and 5 percent in mathematics). Other-CE programs, whether in Title I schools or in schools not having Title I, exhibit substantially higher percentages of students who are neither in the lower half of the achievement distribution nor judged in need of CE services.

In comparing the program cost data of minority and non-minority students, the results indicate that, in reading, non-minority selectees are offered higher resource levels in two of the three categories of selectees (including the Title I category). In those two categories, the differences are 8 and 13 percent over the reading program costs of minority students. However, if we compare minority Title I students to minority non-CE students in Title I schools we see a rather large difference indicating higher resource levels in reading for minority students ($396 vs. $277 or 43 percent). In mathematics (with the exception of Other-CE students in Title I schools) minority students are offered higher resource levels than are non-minority students. Minority Title I students have higher mathematics costs than do either non-minority Title I students or minority non-CE students in Title I schools.

In examining the program cost data in terms of whether students participate in free or reduced price meals programs, the results in reading show no strong differences. In mathematics, the differences, although small, favor participants in meals programs.

Reading Program Cost by CE Selection Categories and Student Minority Status – ALL Grades (in Standard Resource Dollars)

Reading	Reading CE Selection Category														
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	396	182	4278	362	161	1695	358	160	1239	277	157	9092	263	139	2835	290	168	1784
Non-Minority	427	216	5222	344	198	2467	405	203	2007	251	153	24933	239	140	15200	230	147	5972

Mathematics Program Cost by CE Selection Categories and Student Minority Status – ALL Grades (in Standard Resource Dollars)

Mathematics	Mathematics CE Selection Category														
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	260	138	2988	179	89	1212	230	101	939	160	103	9843	148	79	2885	183	140	1694
Non-Minority	220	127	1923	183	110	1979	202	93	1079	141	78	26055	129	63	15114	138	87	5717

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — ALL Grades (in Standard Resource Dollars)

Reading	Reading CE Selection Category														
	Title I Students in in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	414	211	3439	334	190	1658	403	202	1791	250	152	21399	239	141	14461	233	152	5718
Participate	413	197	6061	363	180	2504	368	170	1455	272	158	12626	256	135	3574	273	159	2038

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — ALL Grades (in Standard Resource Dollars)

Mathematics	Mathematics CE Selection Category														
	Title I Students in in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	216	125	1377	178	99	1376	203	90	1005	139	76	21911	131	67	14347	145	98	5485
Participate	256	138	3534	184	106	1815	226	104	1013	158	99	13987	138	66	3652	160	116	1926

CHAPTER 1. THE NATURE OF THE STUDY

INTRODUCTION

This report presents the results of the resource and cost analysis portion of a study of the costs and cost-effectiveness of the resources used in compensatory education. Both the cost and the cost-effectiveness studies are being done by RMC Research Corporation as part of the Sustaining Effects Study (SES) which is being performed by the System Development Corporation. The results of the cost substudy, independently useful as inputs to the policy analysis of compensatory education, are also an integral part of the cost-effectiveness substudy.

The resource and cost analysis is designed to serve two purposes in the SES. One, of course, is to support the cost-effectiveness analysis. The other is to provide information useful in addressing those policy issues, and their research questions, where resources and costs are the variables of interest. Both purposes are met by creating an organized body of information about the quality, quantity and cost of the resources used in various instructional programs in reading and mathematics.

For each student in our analyses we have translated measures of the resources used in providing instruction into estimates of the costs for the student's reading and mathematics instruction. This translation, using standard prices for comparable resources, takes place in a resource cost model developed especially for the SES. The model is based on the resource approach to the analysis of education project cost delineated by Haggart (1971, 1978). The output of the model provides the cost records for the individual student-level instructional programs that are used in our analyses.

PURPOSE OF THIS REPORT

The purpose of this report is to document both our investigation of the resource and cost characteristics of compensatory education, *per se*, and our analysis of the differences between compensatory education services and regular instruction, and to report upon these differences in relation to other student characteristics. The superordinate policy question addressed in the resource analyses is "What is the nature of compensatory education as it is currently implemented?" The results provide a comprehensive description of the resources and costs of compensatory education to non-compensatory, or regular, education. The policy/research questions addressed in the resource analyses fall within two areas.

The first area involves the kinds, amounts and costs of the resources used in providing compensatory education. The second area is concerned with how, in terms of resources and costs, compensatory education services differ from non-compensatory education services. The broader policy questions have each been elaborated into a set of several research questions. These research questions, in turn, provide the framework for the analyses reported in Chapters 3 and 4.

Chapter 4 deals with resource and cost dimensions of compensatory and non-compensatory education in relation to student characteristics other than selection status. These include teacher judgment of student need for compensatory education, student minority status, and student participation in the free-or-reduced-price meal programs.

SCOPE OF THE STUDY

The findings presented in this report are based on the 80,000 students from 242 schools comprising the **Representative Sample** of the SES. The sampling plan, the sampling procedures and descriptions of all three SES samples (the others are the **Comparison Sample** and the **Nominated Sample**) are reported in detail in Technical Report #1 by Hoepfner, Zagorski, and Wellisch (1977). A brief description of the **Representative Sample** is summarized here to provide some idea of the scope of our study. A fuller description is discussed in Technical Report #5, *The Nature and Recipients of Compensatory Education* (Wang, Hoepfner, Zagorski, Hemenway, Brown, and Bear, 1978), which also uses the **Representative Sample** as its data base. The components of the sample are:

- Districts: 219 districts located in 44 states, ranging in size from 55 to over one million students, and from one (1) to 531 schools.

- Schools: 242 schools with a median enrollment of 385 students, ranging in size from 25 to 1,680 students. All grade spans are covered from schools having only one grade to the full span of kindergarten through 12th grade.

- Teachers: 3,478 teachers provided input to the study. The teachers, who teach either reading, mathematics or both, cover a wide range of qualifications and teaching experience.

- Students: More than 80,000 students enter the analyses, depending on the data requirements for a specific analysis. The original counts of students enrolled in grades one through six in the 242 sample schools was 83,135, but missing data items for some students reduced the number of students available for particular analyses. For each school, all students receiving either compensatory or regular instruction are included.

INSTRUMENTS USED IN THIS STUDY

The instruments used in the SES successfully matched the needs of the study with the realities of survey data in the education environment. The instruments are of two types: one group contributes information on the student's instructional program, and the other group enables us to describe the student. A separate instrument, the Cost Data Interview Guide, was used to collect the information necessary for estimating the instructional program cost. The role of this instrument is discussed in the context of the resource cost model designed for the study.

To aid the reader in understanding how the measures of student-level instructional programs were obtained, several of the instruments are discussed in the following paragraphs. A more complete discussion, emphasizing the nature of the study's resource cost model, is presented in Chapter 2.

Instruments Defining a Student's Instructional Program. Six of the eighteen instruments used in the SES form the core or the instructional program resource information for the analyses of this report. Five are used to obtain information on the required resources for the individual student's reading and mathematics instructional program. The sixth instrument, the Student-Teacher Linkage Roster (STLR), links a student to the specific teachers providing instruction. The purpose of each of these six instruments is shown in Table 1-1.

The Student-Teacher Linkage Roster (STLR) is the key in our capacity to generate the dollar measures of the reading and mathematics instruction for individual students in the study. Through the mechanism of the STLR, we are able to link the teacher's description of the student's program – as given on the Student Participation and Attendance Record (SPAR) – with the characteristics of the teachers' program, obtained from Teacher Questionnaire B (TQB), for reading, and Teacher Questionnaire C (TQC), for mathematics.

Table 1-1

The SES Instruments Used to Construct the Resource Measures of Instructional Programs

Instrument	Purpose
Teacher Questionnaire– Section A (TQA)	Records teacher characteristics
Teacher Questionnaire– Section B (TQB)	Records characteristics of each reading teacher's reading program
Teacher Questionnaire– Section C (TQC)	Records characteristics of each mathematics teacher's mathematics program
Principal Questionnaire B (PQB)	Records characteristics of the school's students, staff and programs
Student Participation and Attendance Record (SPAR)	Records the student's exposure to reading and mathematics instruction by time, teacher and group size
Student-Teacher Linkage Roster (STLR)	Links each student with up to three reading and three mathematics teachers

Instruments Describing the Student and Environment. The characteristics of each student, each student's school, and his economic and home environments are available in the SES data base. They are obtained from the other twelve SES instruments, which are listed below according to their use in the analyses.

To provide student characteristics:

- Compensatory Education Roster (CER) – Selection Status
- Comprehensive Tests of Basic Skills – Mathematics (CTBS-M)
- Comprehensive Tests of Basic Skills – Reading (CTBS-R)
- Practical Achievement Scale (PAS)
- Student Affective Measures (SAM)
- Student Background Checklist (SBC)
- Summer Activity Slipsheet (SAS)

To provide characteristics of district, school, economic, and home environments:

- District Characteristics Questionnaire A (DCHA)
- District Characteristics Questionnaire B (DCHB)
- District Expenditure Information Questionnaire (DEX)
- Household Information Questionnaire (HIQ)
- Principal Questionnaire, Section A (PQA)

Data obtained from these instruments are not incorporated directly in estimating the cost of the student's instructional program, but rather are used to develop the independent and stratifying variables for the analyses in this report.

The Cost Data Interview Guide. The individual student is the basic unit underlying the data collection and the analyses. Measures of resources used in providing reading and mathematics instruction are student-based values. Each student's exposure to regular and special teachers, by exposure time, in six group sizes, is obtained. In measuring student use of classroom equipment or materials, the student-based value is the measured value at the classroom level and is apportioned to each student reported by the teacher to be in that classroom. The resource cost model translates measures of resource-use, obtained from the six instruments mentioned earlier, into estimates of student instructional program cost. The result is a measure, in dollars, of an individual student's reading or mathematics instruction, reflecting differences in the resources used to provide instruction for each particular student.

The approach we use in estimating cost requires standard prices either for units of resources (number of teachers) or for units of resource-use (groups of equipments used weekly in the classroom). These prices are based, in part, on resource-availability data collected through the Cost Data Interview Guide (CDIG). Data on resource-availability (obtained from administering the CDIG to a subsample of SES schools and districts) were analyzed, using teachers' estimates of use (from TQB and TQC instruments) as the basis for calculating the price per unit of resource-use. Salary schedules from the subsample districts were used to construct the standard salary schedule used in the model. (The nature of the data collection on resources available for use is described in Appendix A.)

ORGANIZATION OF THE REMAINDER OF THIS REPORT

In Chapter 2 we discuss the basic strategies in our approach to estimating the cost measures, describe the resource cost model and its estimates of cost, and present the results of our sensitivity analysis of the model. Chapter 2 should give the reader an understanding of how the costs were estimated, and provide a basis for interpreting the results.

In Chapter 3 the results of the resource analyses are presented. As stated earlier, the resource analyses are organized around two general policy/research questions: "What are the kinds, amounts and costs of resources used in compensatory reading and mathematics programs?", and "How do compensatory education services differ, in terms of the resources used and their costs, from non-compensatory education services?".

Program costs in relation to selected characteristics of the students are analyzed in Chapter 4. These characteristics include the teacher's judgment of student need for compensatory education services, student minority status, and student participation in the free-or-reduced-price meal program.

The non-resource measures used in analyzing the research questions are a subset of those used in other reports of SES analyses. In Chapter 2 of this report we briefly discuss the measures used in our analyses.

The reader may prefer to skip ahead to the policy-oriented analyses of Chapters 3 and 4, returning to Chapter 2 for clarification as needed.

REFERENCES FOR CHAPTER 1

Hoepfner, R., Zagorski, H., and Wellisch, J., *The Sample for the Sustaining Effects Study and Projections of Its Characteristics to the National Population.* Santa Monica: System Development Corporation, 1977.

Wang, M., Hoepfner, R., Zagorski, H., Hemenway, J., Brown, D. and Bear, M. *The Nature and Recipients of Compensatory Education.* Santa Monica: System Development Corporation, 1978.

Haggart, Sue A., *Program Cost Analysis in Educational Planning.* (P-4744) Santa Monica: The Rand Corporation, 1971.

Haggart, Sue A., *The Resource Approach to the Analysis of Educational Project Cost.* (UR-332) Los Angeles: RMC Research Corporation, 1978.

CHAPTER 2. THE RESOURCE COST MODEL

The resource cost model (RCM) which was constructed translates the measures of student resource exposure into estimates of individual student program cost, using standard prices for comparable resources. The discussion of this RCM is organized in two parts. The underlying strategies for estimating cost, and a description of the model itself, comprise the first part. In the second part, we discuss the types of cost estimates we obtain and the results of our sensitivity analysis of the RCM. Our purposes are to give the reader an understanding of the cost estimates used, and to provide a basis for interpreting the results.

UNDERLYING STRATEGIES FOR ESTIMATING COST

The overall strategy for estimating cost is designed to provide a dollar-metric that reflects our measures of resource exposure, accommodates interregional price differences, and is sensitive to the discernment of intraclassroom differences among instructional programs offered to students. The dollar-metric, expressed as standard resource dollars (SRD), permits cost comparisons among student instructional programs on an equitable basis. We achieve the comparability needed for this study by using the same price, or cost per use, for comparable resources or mixes of resources.

It is along the comparability dimension that the analysis of cost differs from the more traditional cost analysis, where the focus is on analyzing the costs, *per se*. The major strategies that collectively set this approach apart are described in the following paragraphs.

Resource Quantities as Measures. The initial descriptive data obtained from the SES questionnaires describe the instructional programs by the resource quantities used, rather than dollar values. Where resources must be prorated among several students, or where identical kinds of resources (teacher-hours for individual instruction and prorated teacher-hours for group instruction, etc.) must be aggregated for a particular student, the metric again is resource quantities, not dollar values. Dollar values are assigned to a student's instructional program only after the kinds and quantities of resources utilized in that program have been completely specified. This strategy relieves some of the measurement difficulties associated with the use of dollars as a proxy for resource use at the individual student level. In particular, this approach allows the analyses to reflect differences in resource levels utilized *and* differences in the ways resources are used.

Bottom-Up Cost Calculation. In the cost model, the quantity of each type of resource is determined separately for each student's instructional program, then resources are aggregated to obtain a total cost for student resource-use. This contrasts to the more common top-down approach that begins with total resources (often in dollars) and then prorates those resources (or dollars) among students. The bottom-up approach substantially overcomes the problem arising from the implicit assumption underlying the simple proration of total resources – that all students share alike in the use of resources.

Measurement of Resource Exposure. The SES data collection instruments are designed to measure resources offered students in their reading and mathematics instruction, that is, the items measure the resource-use and exposure of the student to those resources. In developing the estimates for the analyses of this report, an attendance adjustment (to 100% attendance) is made in the RCM so that we can obtain the cost of services offered. In the cost-effectiveness studies, to be reported in Technical Report #7 of the SES report series, this adjustment will not be made. We will be using the student's actual resource-use, or *exposure*. The results in either case are different from those obtained by dividing dollar expenditures for resources by the number of students. To be sure, it is theoretically possible that for some categories of resources the measures may be equivalent. But, as noted, this would be the case only where the students share equally in the use of the particular resources.

Relevant Costs. The relevant cost in our analyses is the cost of resources that vary from student program to student program. In the SES, the analysis is designed to identify the differential resources used in providing instruction to various categories of students. The cost we calculate, therefore, includes only those resources that differentiate one student's instructional program from another's. Resources that are commonly used in providing instruction to all students are not included; for example, we do not include costs of typical classroom space, furniture, general supplies, operation, and administration.

The Use of Total Variable Resources. In typical applications of resource/cost analysis, where the intent is to estimate the marginal cost (or additional expenditures) necessary to implement a particular educational program at a particular site, the bottom-line cost estimates usually represent *net* resource requirements. Resources that are already on hand and that will require no additional expenditure are excluded from the cost calculations. In the SES, where the object is to make simple dollar-metric comparisons of compensatory education practices (the distinguishing feature among programs), the *total* variable resource requirements are the more appropriate basis for cost calculations.

Comparable Costs Obtained Through Standard Prices. Keeping with the spirit of the above paragraph, we translate total variable resource requirements into estimates of comparable cost by using standard prices rather than district-specific prices. In comparing the various instructional programs, our cost figures reflect differences in the quantities and qualities of resources used to achieve educational outcomes. Comparisons of costs based on site-specific prices tend to obscure the very differences we seek to reveal. Teachers, for example, are paid according to different salary schedules in different districts; by using our standard salary schedule, teachers with the same educational and experience qualities have the same salary in our cost estimates. Thus, our cost estimates reveal rather than conceal differences in resource-use, permitting equitable comparisons across the schools of the sample.

MODEL DESCRIPTION

The resource cost model is both an abstraction of the instructional process (with respect to calculating the costs of instruction) and a series of operations and processing activities that actually produce the cost estimates. The RCM will be described by providing an overview

of its structure, detailing the model inputs, describing the model operation of translating (descriptions of the quantities of resources used) inputs into estimates of costs, and describing the types of cost estimates provided by the model.

Overview. The model structure is depicted in Figure 2-1. The inputs to the resource cost model are of two types: those which measure the quantity (Q) of the resources used, and those which give a price per unit (P) of the resources. The questionnaire item responses on resource-use provide the Q inputs, and the unit price of resources developed through pricing algorithms provide the P inputs. The operation of the model multiplies the quantities of resource-use by the prices per unit of resource-use and sums or apportions these products to achieve the values of cost variables associated with individual student programs. These cost variables, the model outputs, are identified either in terms of the type of resource variable or the type of instructional program component.

The quantities of the resources are measured at the organizational level, where use varies. These levels are student, class, and school. As examples the use of instructional staff of various types in different group sizes is measured at the student level; the use of instructional equipment and materials is measured at the classroom level; and the use of school-wide instructional support personnel, such as media specialists, is measured at the school level.

Model Inputs. Responses from the Student Participation and Attendance Record (SPAR), certain items from the Teacher Questionnaire (Sections B and C) and certain items from the Principal Questionnaire (Section B) provide data on type, frequency of use, and characteristics of the resources used for an individual student's instructional program. These data provide information on the quantity (Q) for each resource variable. The major inputs used in estimating the instructional program cost are depicted in Figure 2-2. Pricing algorithms are used to generate the standard prices (P) for the measures of resource-use for student-level instructional programs. Briefly stated, the process combines measures of resource-use, and averages of the particular prices prevailing in a subsample of the districts, in order to calculate the standard price values. One reason for basing the pricing algorithms on subsample data was to permit the use of less precisely specified resource-use measures in the larger sample, thereby reducing both the respondent burden and the cost of data collection. Less precision here means, for example, that the teacher was not asked to specify the number of pieces of equipment being used but simply to respond whether sound equipment was being used, for example, once a week.

The standard prices that result from the algorithms are either the price of a single unit of resource, e.g., teacher salary, or the price that is related to the level of use for a particular type of resource, e.g., the use of sound equipment once a week. Different kinds of pricing algorithms are used to develop the prices for staff salaries, equipment, materials, and the categories of direct instructional support.

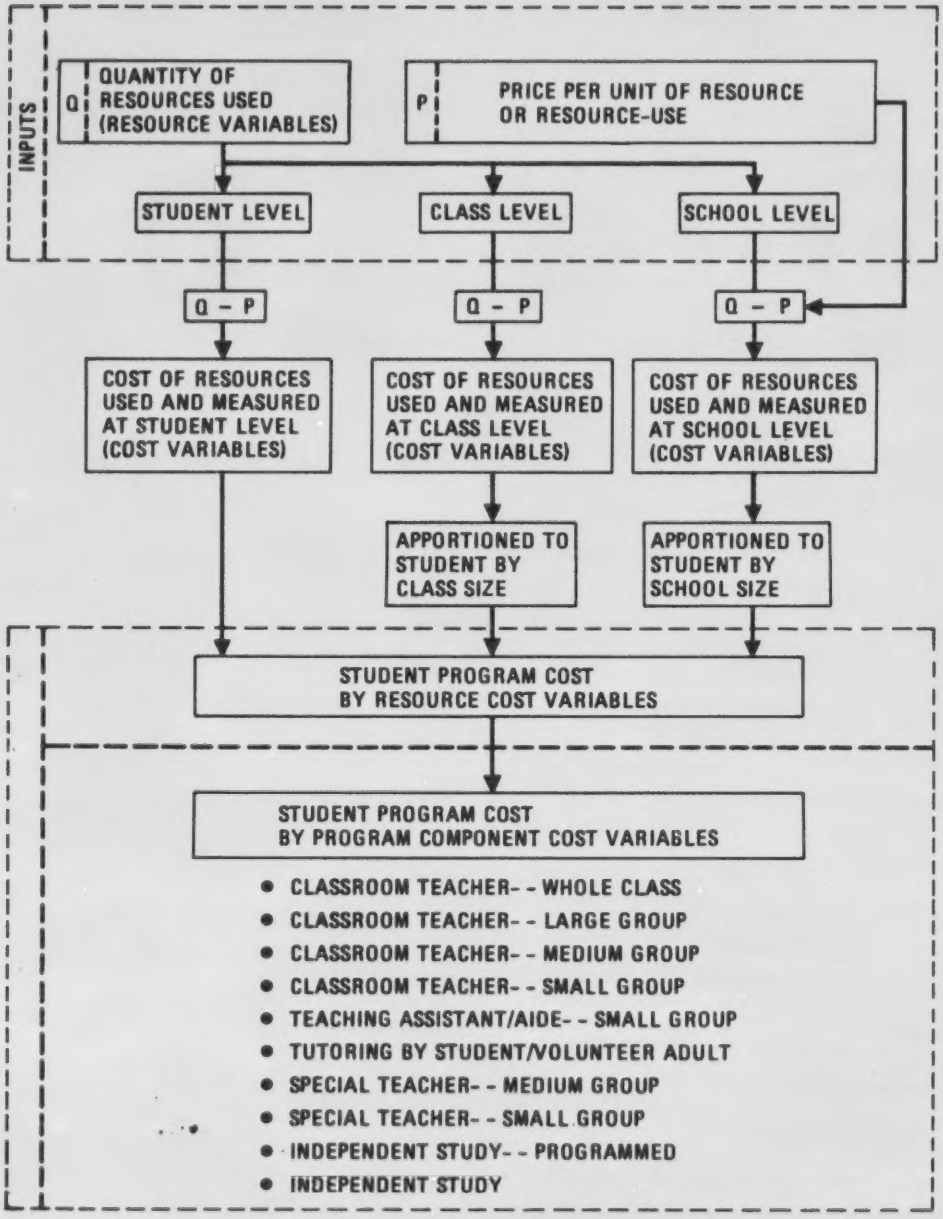
INPUTS
Q
QUANTITY OF RESOURCES USED (RESOURCE VARIABLES)
P
PRICE PER UNIT OF RESOURCE OR RESOURCE-USE
STUDENT LEVEL
CLASS LEVEL
SCHOOL LEVEL
Q - P
Q - P
Q - P
COST OF RESOURCES USED AND MEASURED AT STUDENT LEVEL (COST VARIABLES)
COST OF RESOURCES USED AND MEASURED AT CLASS LEVEL (COST VARIABLES)
COST OF RESOURCES USED AND MEASURED AT SCHOOL LEVEL (COST VARIABLES)
APPORTIONED TO STUDENT BY CLASS SIZE
APPORTIONED TO STUDENT BY SCHOOL SIZE
STUDENT PROGRAM COST BY RESOURCE COST VARIABLES
STUDENT PROGRAM COST BY PROGRAM COMPONENT COST VARIABLES
• CLASSROOM TEACHER- - WHOLE CLASS
• CLASSROOM TEACHER- - LARGE GROUP
• CLASSROOM TEACHER- - MEDIUM GROUP
• CLASSROOM TEACHER- - SMALL GROUP
• TEACHING ASSISTANT/AIDE- - SMALL GROUP
• TUTORING BY STUDENT/VOLUNTEER ADULT
• SPECIAL TEACHER- - MEDIUM GROUP
• SPECIAL TEACHER- - SMALL GROUP
• INDEPENDENT STUDY- - PROGRAMMED
• INDEPENDENT STUDY

Figure 2-1

Overview of Resource/Cost Model: Resource Variables to Cost Variables to Program Component Costs

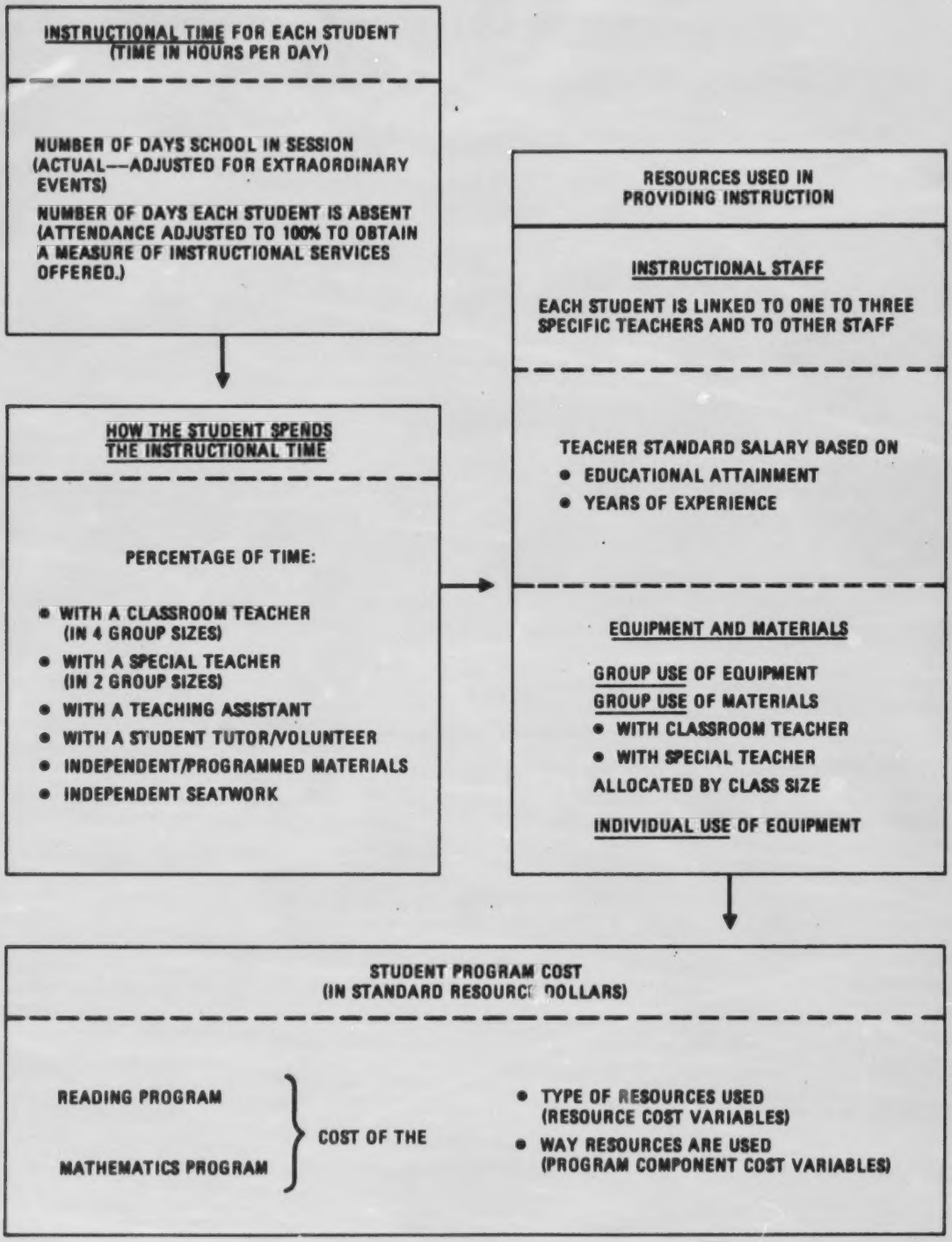
INSTRUCTIONAL TIME FOR EACH STUDENT
(TIME IN HOURS PER DAY)
NUMBER OF DAYS SCHOOL IN SESSION (ACTUAL—ADJUSTED FOR EXTRAORDINARY EVENTS)
NUMBER OF DAYS EACH STUDENT IS ABSENT (ATTENDANCE ADJUSTED TO 100% TO OBTAIN A MEASURE OF INSTRUCTIONAL SERVICES OFFERED.)
HOW THE STUDENT SPENDS THE INSTRUCTIONAL TIME
PERCENTAGE OF TIME:
• WITH A CLASSROOM TEACHER (IN 4 GROUP SIZES)
• WITH A SPECIAL TEACHER (IN 2 GROUP SIZES)
• WITH A TEACHING ASSISTANT
• WITH A STUDENT TUTOR/VOLUNTEER
• INDEPENDENT/PROGRAMMED MATERIALS
• INDEPENDENT SEATWORK
RESOURCES USED IN PROVIDING INSTRUCTION
INSTRUCTIONAL STAFF
EACH STUDENT IS LINKED TO ONE TO THREE SPECIFIC TEACHERS AND TO OTHER STAFF
TEACHER STANDARD SALARY BASED ON
• EDUCATIONAL ATTAINMENT
• YEARS OF EXPERIENCE
EQUIPMENT AND MATERIALS
GROUP USE OF EQUIPMENT
GROUP USE OF MATERIALS
• WITH CLASSROOM TEACHER
• WITH SPECIAL TEACHER
ALLOCATED BY CLASS SIZE
INDIVIDUAL USE OF EQUIPMENT
STUDENT PROGRAM COST
(IN STANDARD RESOURCE DOLLARS)
READING PROGRAM
MATHEMATICS PROGRAM
COST OF THE
• TYPE OF RESOURCES USED (RESOURCE COST VARIABLES)
• WAY RESOURCES ARE USED (PROGRAM COMPONENT COST VARIABLES)

Figure 2-2

The Major Determining Factors of Instructional Program Cost

The pricing algorithms for the price of a unit of resource, in this case the teacher, is discussed in detail here. In the RCM, the teacher salary is a surrogate for the qualities of a specific teacher. The teacher salary figure, or the standard price for a teacher, reflects:

(1) the mean base salary for the category

(2) an increment for years of education

(3) an increment for years in teaching

Each teacher who is identified as a classroom teacher and who has the same responses in (2) and (3) above is considered a comparable resource and is assigned the same standard price or salary, regardless of the actual salaries paid in the specific school district. The teacher salary schedules for the subsample of schools (and districts) visited by RMC staff in the spring of 1977 provide the information for determining the mean base salary. The multipliers for education and experience used to estimate the dollar increments to the base salary were also calculated from the teacher salary schedules. Specifically, data on how all of the subsample districts compensate their teachers for education and experience was incorporated into the basis for assigning increments to base salary.

The prices for the various categories of equipment and materials were constructed in a different fashion. The data on resources available in the schools of our data collection subsample were used to generate a combined inventory-cost-per-year estimate for each category of equipment and materials. The combined inventory cost (for each category) was then distributed among the appropriate pattern-of-use response items obtained from the SES Teacher Questionnaire B, for reading, and Teacher Questionnaire C, for mathematics.

The distribution among the pattern-of-use responses was accomplished by scaling the questionnaire response items to the one-use-per month basis. Next, each scaled response score was weighted by the respective number of the subsample teachers responding. The combined inventory cost is the sum of the products obtained by multiplying the frequency of the teacher responses, the scaled response values and the price. Solving for P, the price, yields the price-per-year for the one-use-per month response.

The outcome of this procedure is a series of prices for our categories of equipment and materials. The RCM uses these prices in combination with the teacher responses from the entire SES sample to generate a cost-per-year for each level of use.

Model Operation. Five subprograms (0100 to 0500) comprise the RCM. The purpose and nature of the five subprograms are briefly described. A more detailed discussion of the RCM is available in Appendix A and the resource cost data tapes (containing individual student cost records as the outputs of the model) have been incorporated in the SES data base at SDC.

- *Subprogram 0100.* Generates records on the basis of the Student-Teacher Linkage Roster (STLR) that can be matched by teacher ID number against the Teacher Extract File. (The Teacher Extract File is a separate file that extracts

appropriate data from the SES teacher-specific instruments.) For each teacher specified on the STLR, a teacher linkage record is created.

Inputs: Student-Teacher Linkage Roster File

Output: Teacher Linkage File

- *Subprogram 0200.* Obtains teacher information relating to individual students. The Teacher Linkage File and the Teacher Extract File are matched on school and teacher ID numbers.

  Inputs: Teacher Linkage File and Teacher Extract File

  Output: Student-Teacher File

- *Subprogram 0300.* Generates a file (SPARMPR) combining information contained in the Student Participation and Attendance Record for reading and for mathematics (SPARM) with that in the Principal Questionnaires, Section A and B, (PQAB). Input files are matched on school and student ID numbers; for each match a SPARMPR record is created.

  Inputs: SPARM File and Principal File

  Output: Combined SPARM and Principal File–SPARMPR File

- *Subprogram 0400.* Combines information from the SPARMPR file of Subprogram 0300 and the student-teacher linkage file of Subprogram 0200. Produces a student resource record.

  Inputs: SMARMPR File and Student-Teacher Linkage File

  Output: Student Resource Record File

- *Subprogram 0500.* Creates the Resource-Program file from the student resource record. Incorporates the standard salary schedule matrix, other prices, and the adjustment factors of quantity, length, size and time.

  Inputs: Student Resource Record File

  Output: Reading and Mathematics Resource-Program Files

The Model Outputs. The subprogram 0500 output, described above as the Reading and Mathematics Resource-Program Files, produces individual student reading and mathematics total program costs in two forms. One is total cost showing subtotals by the *resource* cost variables, the other form shows total cost by the subtotals for the *program* component cost variables.

The resource cost variables are simply the cost by type of resource. The total program costs by resource cost variable are shown in Tables B-1 through B-15 in Appendix B. The program component cost variables are the cost by the delivery configuration within which the student receives instruction. The program components correspond to the categories on the Student Participation and Attendance Record (SPAR). These categories are the choices the SES teachers have available for describing how student time is spent in reading and mathematics instruction. The restructuring of the resource cost variables into the ten program component cost variables is shown in Figure 2-3.

The program component cost is the sum of the corresponding resource cost variables for personnel plus an apportioned share of the cost for equipment, materials, and the instructional support resource cost variables. In brief, the resource cost variables let us examine the resource mixture of the individual student's total program cost; the program component cost variables permit an examination of the total program cost in terms of the cost of the different delivery configurations used to provide instruction.

Average Costs Generated for SES Students. Total student program costs produced by the RCM, for reading, range from a high mean of $370 for 14,001 1st-grade students to a low of $197 for the 15,560 students in the 6th-grade. For mathematics, the high mean is $161 for 13,210 5th-graders and the low mean is $133 for 12,527 2nd-graders. In Table 2-1, the mean total cost and the number of students for each grade are presented.

Table 2-1

Mean Total Student Program Cost and Number of Students by Grade

	Reading		Mathematics	
	Mean Total Cost	Number of Students	Mean Total Cost	Number of Students
Grade 1	370	14,001	143	14,038
Grade 2	338	12,487	133	12,527
Grade 3	302	12,329	153	12,399
Grade 4	250	12,491	160	12,497
Grade 5	225	13,134	161	13,210
Grade 6	197	15,560	149	15,340
ALL	281	80,002	152	80,011

(Caveat: It is important to remember that these cost figures are not the same as expenditures, nor are they costs in the usual economic sense. Rather, they are a very special dollar-metric designed to measure students' resource exposure. As noted earlier in this chapter, the metric is based on the application of standard prices to comparable resources and the resulting costs are identified as standard resource dollars (SRD). Also, the metric measures only relevant instructional resources, excluding resources common to the operation of most school systems, such as building maintenance and school administration.)

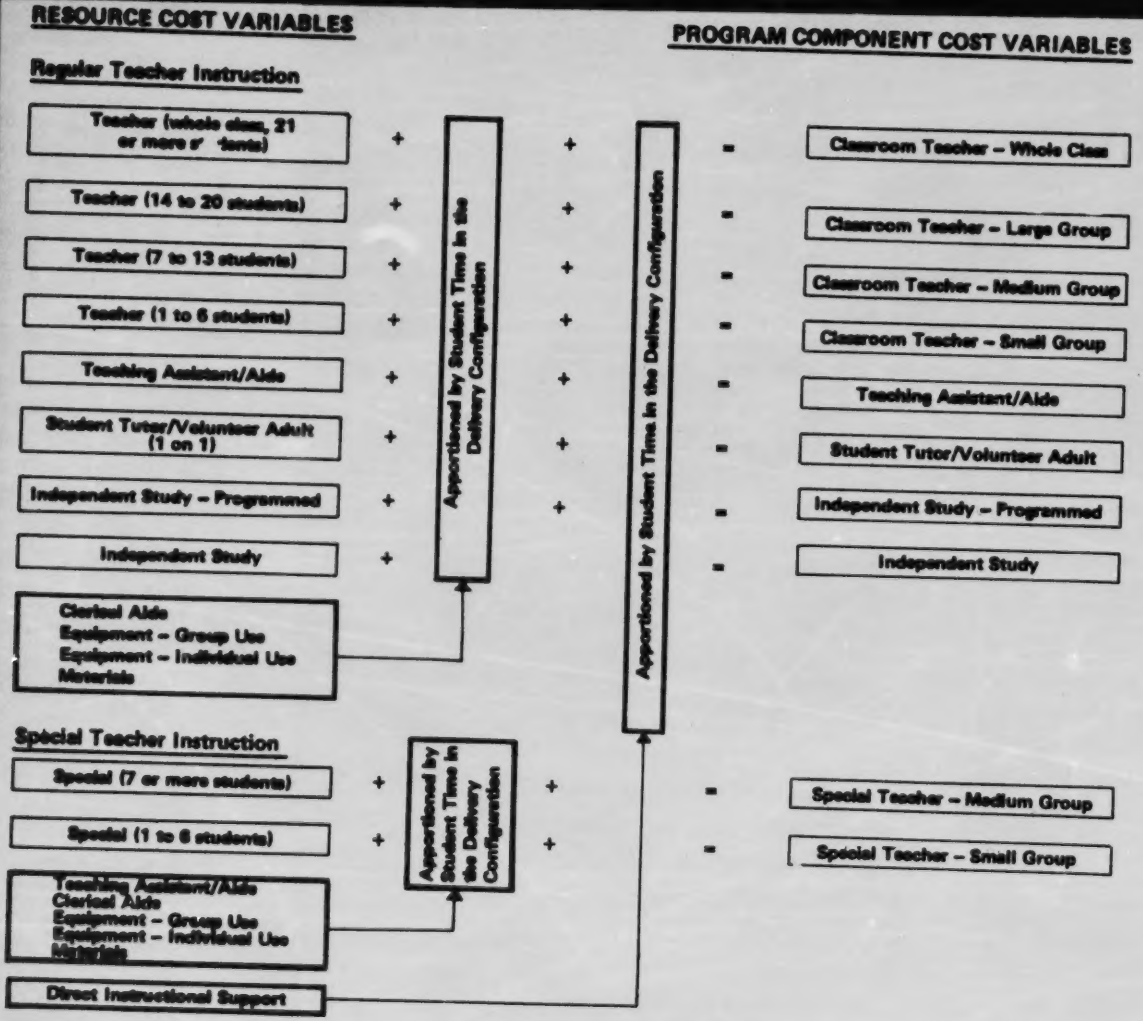
RESOURCE COST VARIABLES
PROGRAM COMPONENT COST VARIABLES
Regular Teacher Instruction
Teacher (whole class, 21 or more students)
Teacher (14 to 20 students)
Teacher (7 to 13 students)
Teacher (1 to 6 students)
Teaching Assistant/Aide
Student Tutor/Volunteer Adult (1 on 1)
Independent Study – Programmed
Independent Study
Clerical Aide
Equipment – Group Use
Equipment – Individual Use
Materials
Apportioned by Student Time in the Delivery Configuration
Apportioned by Student Time in the Delivery Configuration
Classroom Teacher – Whole Class
Classroom Teacher – Large Group
Classroom Teacher – Medium Group
Classroom Teacher – Small Group
Teaching Assistant/Aide
Student Tutor/Volunteer Adult
Independent Study – Programmed
Independent Study
Special Teacher Instruction
Special (7 or more students)
Special (1 to 6 students)
Teaching Assistant/Aide
Clerical Aide
Equipment – Group Use
Equipment – Individual Use
Materials
Apportioned by Student Time in the Delivery Configuration
Special Teacher – Medium Group
Special Teacher – Small Group
Direct Instructional Support

Figure 2-3

Restructuring the Resource Cost Variables into Program Component Cost Variables

SENSITIVITY ANALYSES

The conventional approach for assessing the logical consistency of the behavior of resource/cost models is to conduct sensitivity analyses. The approach is to systematically vary the values of model parameters, such as the procedures for calculating salaries, and then to observe the resulting behavior of the outputs of the model. If the outputs behave in an illogical or inconsistent manner, either the model algorithms are faulty, or the model has simply revealed unexpected real-world behavior. Either case calls for closer scrutiny of the model — in the former case to alter the algorithm, in the latter case to better understand the real world. We conducted sensitivity analyses using data from a 35-school subset of the SES **Representative Sample.** The analyses were addressed to both personnel resources and the categorized materials and equipment. In some cases standardized price inputs were varied to observe the effect upon model outputs. In other cases certain characteristics of the model algorithms were varied.

Ideally, in a sensitivity analysis, the results of the model would be compared with the analytic results of the total study. For example, we might have compared the effects of modifying the RCM with the cost comparisons between first grade compensatory and non-compensatory reading programs. However, this was judged to be an unwarranted expense because the operation of the RCM and the analysis of its outputs are separated by a costly data-file generation step, a step that would have to be repeated for each model variation tested. For this reason, we examined only the RCM cost estimates, using this information to judge the probable impacts on the eventual analytic results.

Personnel Resources. The *salary price* schedule for regular and special teachers was altered in two ways. In the first case, the salary schedule was recomputed in a fashion that relies solely on education credentials, ignoring teacher years-of-experience. This was done by adopting the rate given by the salary schedule for 3-5 years of experience. These rates are displayed in Table 2-2.

In the second case, to test the sensitivity of the model to variations in teacher educational attainment, the standardized salaries were reduced to a single value, $9.40 per hour. The mean and variance of resource cost variables and program component cost variables were examined for both cases.

The effects observed in both cases were virtually the same. The average values of the teacher-related student resource cost variables were all decreased 20 to 25 percent. The decrease itself was an artifact of the particular salary prices specified, and is not noteworthy. The important result is that the relative change was uniform for the affected variables. This suggests that the model output is robust with regard to changes in the way salaries are computed, that is, the comparative cost rankings of different instructional programs will tend to be invariant with respect to these changes. Apparently, the mix of experience and education represented among teachers linked to the various instructional group sizes is fairly constant.

There was somewhat more variation in the effects on the program component cost variables, with an 11 to 21 percent decrease. This heightened variation is because the allocation of the

Table 2-2

Standard Salary Schedule
(For Three to Five Years' Experience Only)

Education Attainment	Standardized Salary per Hour
No degree, or diploma based on less than four years work	$ 7.40
Bachelor's degree	9.40
Bachelor's degree plus fifth-year preparation	9.40
Master's degree	10.40
Six-year specialist degree	10.90
Doctorate	11.40

non-teacher related costs to the program component cost variables remains the same regardless of changes in salary prices. Thus, program component cost variables that include relatively high teacher costs, as for example, instruction in small groups, are affected more than those with relatively low teacher costs, as for example, instruction in large groups.

It does not seem likely that the different bases for salary calculation would greatly affect the relative costs of different student programs, unless one of the otherwise equal cost programs has a much higher utilization of non-teacher resources than the other. Sufficiently extreme differences in non-teacher resources are not likely, given the broad categories analyzed in this report and the overall positive correlation between teacher-related and non-teacher related resources to be noted later. For example, the rankings in average total student program cost for the subsample of 35 schools, under the original salary algorithm, were compared with those where the algorithm depends only on education; we consider this to be a conservative test because the school-by-school grouping is much finer than any anticipated in the analyses. The average difference in rank was only 1.2; the Spearman's rank correlation was 0.98.

The *size factors* were another area where assumptions were made in the algorithms for teacher-related resource cost variables. These factors distribute teacher cost among the student participants of an instructional group of a particular size. For example, a student who receives instruction in a medium size group (seven to fourteen) is allocated one-tenth of the cost of the teacher for the length of time he participates in that group. The factors for the small, medium, and large group sizes were set at or near the midpoints of the respective size range. In the case of the open-ended whole class grouping, the *size factor* was set at 25. In order to observe the sensitivity of model outputs to this factor, we

assessed the impacts of two alternative factor values, 22 and 28, values that some may argue are as equally logical as the value 25. The size factor of 22 increased the whole class resource cost variable by 14 percent. The size factor of 28 decreased the whole class resource cost variable by 11 percent. In both cases, the average total student program cost was altered by only one percent. Thus, variations in this factor within the logical range are not likely to greatly affect comparisons among large groups of students.

We were also interested in examining the size factor for small group instruction by a regular teacher. The model sets this factor at four, slightly above the midpoint of the one-through-six range, to reflect our judgment that, even in individualized instruction, the student does not always receive the exclusive attention of the teacher. Nevertheless, we tested the model output with a reduced size factor of two for the small group instruction category. As expected, the value of this resource cost variable doubled. The average total student program cost for the approximately 5,000 students who received instruction in this category increased by approximately 65 percent; the average cost for all students increased by 26 percent. Thus it appears that the impact of small absolute changes in this size factor have significant impact, partly because the relative change is large, and partly because when a student receives instruction in this category it accounts for a large percentage of his total instructional program cost. The large impact notwithstanding, we decided to remain with the size factor set at four. The large impact did not alter our opinion that the appropriate value for this size factor is four – reflecting our judgment that it is probably relatively rare that a given student receives truly individualized instruction from a regular classroom teacher for non-trivial periods of time.

Equipment and Materials. The overriding question with regard to equipment and materials was simply whether they are of any significant proportion of total cost. A related question is whether the *variation* in equipment and materials costs between student programs is significant compared to the variation of personnel costs. Even though materials and equipment may constitute a relatively small part of total program costs, their use in providing instruction may be much more discretionary than is the use of personnel resources. Therefore, the use of equipment and materials may be more likely the target of variations in local educational spending.

Table 2-3 addresses both questions by summarizing the magnitude and variation of equipment/materials costs relative to instructional personnel and support personnel costs; the data are for the subsample of 35 schools. Note that the average equipment/materials cost is 13 percent of the average total student program cost. The variance for equipment/materials is proportionally less, only three percent. Furthermore, there are positive correlations among the three cost components in the table, accounting for 15 percent of the variance for total program cost; in other words, a student with high equipment/materials costs typically also has high instructional personnel costs, and *vice versa*. It therefore does not seem likely that variation in equipment/materials costs has a significant independent effect on total student program cost. For example, we would not expect high equipment/materials cost to offset an otherwise low-cost student program.

The general sensitivity of the model to changes in equipment and materials costs can be tested in two ways. First, price factors can be systematically increased. Second, the method of deriving the cost factors can be altered.

Table 2-3

Instructional Costs for Sensitivity Analysis
Subsample of 12,820 Students
(In Standard Resource Dollars)

	Mean		Variance	
Instructional Personnel Costs	244	(85%)	24,788	(81%)
Support Personnel Costs	7	(2%)	191	(1%)
Equipment Materials Costs	36	(13%)	1,001	(3%)
Variance component due to intergroup correlation	–	–	4,633	(15%)
Total Student Program Cost	287	(100%)	30,613	(100%)

The effects of the first test can be assessed without actually exercising the model. If, for example, the price factors were doubled to reflect an assumption that the useful lifetimes of equipment and materials are one-half the original assumption, ther the average total student program cost would increase by 13 percent (from $287 to $323). The variance of the equipment/materials cost component would quadruple, and there would also be an increase in the variance component attributable to the correlation between equipment/materials and personnel costs. Variance of total program costs would increase commensurately. Given the correlation effect, however, one would not expect much difference in the results of comparisons among major categories of students.

The second test required modifictions in the model algorithms for deriving price factors. The general strategy behind these algorithms is to obtain price measures that are directly proportional to usage rates, even though the dollar expenditure costs for maintaining appropriate inventories may not be highly sensitive to variations in usage rates. The responses on usage patterns, obtained from the Teacher Questionnaires, Sections B and C, characterize particular items of equipment or materials being used as never or almost never, once a month, once a week, or two or more times each week.

For equipment, the model weights these categories according to a 1:4:8 ratio, that is, the charge to a student's program is four times as high for once-a-week use as for once-a-month use, and the charge for twice-a-week (or more) use is eight times higher. In order to explore the effects of price factors that are *less* sensitive to usage rates, equipment charging ratios of 1:2:4 and 1:2:2 were tested. A ratio of 1:4:20 was tested to assess the use of factors that are *more* sensitive to usage rates.

The charging ratio used by the model for materials is 1:4:16. The alternate ratios tested in this case were 1:4:8, 1:2:2, and 1:4:20.

Changes in average total student program costs attributable to the six alternate charging ratios (three for equipment and three for materials) were all within one percent; this small variation was expected because the modified ratios were not expected to alter the overall price levels. We did expect to see some differences in the relative costs for different grade levels and for different schools, reflecting different usage patterns in these groupings, but even here the effects were minimal. In no case were there more than minimal changes in the F-ratio of between-group variance to within-group variance.

An interesting pattern of effects did occur in the grade level comparisons: the sixth grade, and the fifth grade to a lesser degree, registered small cost increases under the 1:4:20 ratios and decreases under the other ratios; the first through third grades registered compensating changes in the other direction; the fourth grade costs held fairly constant. In all cases, however, the changes were small, the largest being an increase of about five dollars per sixth grade student, or about two percent of average total cost, under the 1:2:2 charging ratio.

The model outputs are fairly robust with respect to most of the alternatives we imposed in the sensitivity analysis. The only one that should be of concern is the size factor for small group instruction. Changing this size factor from four to two increased average total student program costs by twenty-six percent; since only forty percent of the students received instruction in this size grouping, the average impact on these students was much higher. We chose to remain with the size factor equal to four, judging this to be the more likely mean group size for small group instruction, and lacking empirical group size information that would indicate otherwise.

SUMMARY

The first two chapters describe the nature of our study and the strategy we used to estimate the costs of the student-level instructional programs. As an aid to interpreting the analyses of Chapters 3 and 4, a brief summary of the points to remember was provided.

The study includes the approximately 80,000 students who are enrolled in the 242 schools, and who receive either compensatory education services or regular (non-compensatory) instruction. Our basic information is provided by the 3,478 classroom and special teachers who teach reading or mathematics or both reading and mathematics. In addition to providing information about their level of educational attainment and years of teaching experience, the teachers describe their approach to teaching reading or mathematics.

One of the most important sources of information about the resources used is the Student Participation and Attendance Record. This instrument is used by the teachers to record the percentage of instructional time each student spends in ten different delivery configurations.

The instructional time, the percentage of time in different delivery configurations, the resources used and the cost of the resources are combined within the RCM to produce the estimates of cost for the student-level instructional program. The resulting cost estimate is a dollar-metric that reflects the measures of resource use, accommodates interregional price differences, and is sensitive in discerning intraclassroom differences among the instructional programs offered to students. It is this dollar-metric, expressed as standard resource dollars, that allows us to make the cost comparisons of Chapters 3 and 4 on an equitable basis.

CHAPTER 3. RESOURCE ANALYSIS OF COMPENSATORY EDUCATION

In the preceding chapters of this report we discussed the general nature of our study and described the nature of the RCM used to estimate the cost of the student instructional programs. The purpose of this chapter is to employ the cost estimates generated by the RCM, along with information about students, in various analyses addressed to those policy issues in compensatory education where the amount of resources is of interest. The analyses concern themselves with two primary questions. The first question is, "What are the kinds, amounts, and costs of resources used in compensatory reading and mathematics programs?". The second is, "How do compensatory education services differ from non-compensatory or regular education services?".

Both of these questions fall under the broader policy issues arising from a concern with the nature of compensatory education as it is currently implemented. In particular, we are dealing with the nature of compensatory education in terms of alternative uses of resources as well as different levels of resource-use.

After discussing some definitions, we present the results of our analyses. These results provide the information on resources and costs needed to address the policy issues. The total and subtotal program costs and the program component costs are analyzed with respect to six CE selection categories used in the SES to categorize the study's students.

In addressing these questions, we maintain the distinctions within the three CE Selection categories of students who are offered CE services and within the three selection categories of students who do not receive CE services. The six selection categories are: Title I students in Title I schools, Other-CE students in Title I schools, Other-CE students in Other-CE schools, non-CE students in Title I schools, non-CE students in Other-CE schools, and non-CE students in non-CE schools.

Despite our maintenance of these distinctions in our data presentation, our tendency is to summarize the results of the various analyses in terms of a selectee, non-selectee dichotomy. As the results of the analyses will make clear, the dichotomy is the locus of the more substantial and relevant cost difference. We complete the discussion of this chapter with an analysis of the cost of educational services by grade level. In each case, the reading results are presented first and are followed by the findings for mathematics. In both Chapters 3 and 4, we present the cost data pooled over grade levels. Supporting tables of within-grade-level data are given in Appendices C and D.

DEFINITIONS AND MEASURES

Before we present the results of the resource analysis study, we discuss two definitional matters that are important to understanding the data that follow. The first of these is the use of the terms compensatory education 'selectee', or 'designee', or 'recipient' of compensatory education services. Throughout this chapter the term 'selectee' is used to mean

that students were reported as designated to receive compensatory services. The student assignments to any one of the six student selection categories discussed in this report are based upon the reports of school coordinators, teachers, and principals; the assignments are the same as for the overall Sustaining Effects Study.

The second definitional matter concerns the nature of the cost values reported with respect to selection category. The cost data we report are sample means, cross-classified with student variables as well as selection category. It is important to note that these means are averages across all sampled students within any cell of any cross-classification. That is, students for whom our cost estimate is zero for a particular resource cost variable, program component cost variable, or subtotal cost estimate are included in the analysis. For example, some students were reported as receiving no instruction in a whole-class delivery configuration by a regular reading teacher. The estimate of the cost of whole-class instruction by a regular reading teacher for those students would be zero (the cost for these students obviously occurs under other resource cost variables); the zero values would nevertheless enter into the overall calculation of the group mean for that resource variable in whichever selection categories the students are assigned.

By presenting the cost data in this manner, we maintain a consistent basis for making comparisons among the six categories of selection status. Were we to consider only those students receiving a particular service, such as instruction by a special teacher in a small group, and ignore those students not receiving that service, we would then be confusing the costs of the service with the different rates of receipt of each service among the six selection categories. This would result in a substantial alteration of the basis of comparison among the six categories, since the receipt of particular services (certain program components) is related to selection category. In addition, by including all students in the calculation of mean costs for any particular program component variable, the sums of the costs of the program components are equal to the total program costs within each selection category — within the bounds of rounding error.

In addition, we have not adjusted the cost of each student's instructional program for the amount of time he might have been absent from school during the 1976-1977 school year. Therefore, the data we report are estimates of the cost of resources offered to students. In a later report dealing with cost and effectiveness, the cost estimates for each student are to be adjusted to reflect the receipt of services and actual attendance.

WHAT ARE THE COSTS OF THE RESOURCES USED IN THE READING AND MATHEMATICS INSTRUCTION OF COMPENSATORY EDUCATION SELECTEES?

The basic cost estimates developed in this study are shown in Tables 3-1 and 3-2. Table 3-1 presents the cost of the reading programs offered to students in terms of the total cost of the reading programs, showing three subtotals: teaching personnel, instructional support, and use of equipment and materials. The distribution of the cost data is summarized by presenting the costs at each of three percentiles: 25th, 50th and 75th. Similar data are presented separately for each grade level in Appendix C. Table 3-2 presents the mathematics program costs pooled over grades.

Table 3-1

Cost of Reading Programs Offered to ALL Grades by Student CE Selection Categories (In Standard Resource Dollars)

	Reading CE Selection Category											
	Title I Students in Title I Schools 9785 Students		Other-CE Students in Title I Schools 4349 Students		Other-CE Students in Other-CE Schools 3387 Students		Non-CE Students in Title I Schools 35781 Students		Non-CE Students in Other-CE Schools 18654 Students		Non-CE Students in Non-CE Schools 8046 Students	
Reading Program Cost	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	336	186	303	173	316	178	219	146	205	132	210	149
Instructional Support	17	22	7	10	10	14	3	7	3	7	2	7
Equipment and Materials	59	38	40	25	58	36	34	22	33	22	32	19
Reading Total Program Cost	411	202	350	184	384	188	257	154	242	140	244	155
25th Percentile	264		216		251		151		144		128	
50th Percentile	376		324		349		220		209		201	
75th Percentile	518		434		477		323		299		314	

Table 3-2

Cost of Mathematics Programs Offered to ALL Grades by Student CE Selection Categories (In Standard Resource Dollars)

	Mathematics CE Selection Categories											
	Title I Students in Title I Schools 5296 Students		Other-CE Students in Title I Schools 3674 Students		Other-CE Students in Other-CE Schools 2233 Students		Non-CE Students in Title I Schools 41035 Students		Non-CE Students in Other-CE Schools 19711 Students		Non-CE Students in Non-CE Schools 8062 Students	
Mathematics Program Cost	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	194	118	155	96	172	87	124	81	113	65	129	101
Instructional Support	15	23	3	7	10	17	2	6	1	3	1	3
Equipment and Materials	32	23	21	13	32	25	20	14	18	12	19	11
Mathematics Total Program Cost	241	134	180	101	213	97	146	85	132	66	148	103
25th Percentile	143		109		144		92		91		91	
50th Percentile	210		156		194		118		113		117	
75th Percentile	304		217		252		171		153		164	

Reading Cost. We begin first by examining the reading cost data of CE selectees. These data appear in the first three columns of Table 3-1. The data show that Title I students are offered the highest level of resources among the three CE selectee groups. The magnitude of the differences in reading total program cost between Title I students and Other-CE students in Other-CE schools is not of substantial practical significance. Title I students have a small advantage ($411 vs. $384). However, the differences between Other-CE students in Title I schools and the other two categories of CE selectees are of greater magnitude, with the Other-CE students at Title I schools exhibiting a mean cost ($350) that is nearly 15 percent lower than that of Title I students.

As the data presented in Tables C-1 through C-6 of Appendix C show, the total program cost for reading shows a fairly consistent pattern across all six grades in terms of the rank orderings of the three CE selection categories. With the exception of grade one, Title I students show the highest (or a value equal to the highest) total cost. In the first grade, the category Other-CE students in Other-CE schools shows the highest cost. For all grades, the category Other-CE students in Title I schools shows the lowest total cost among the three CE selectee groups.

With respect to the three subtotal costs, the data of Table 3-1 (for CE selectees) show a similar pattern. Again, Other-CE students in Title I schools typically are offered less in personnel resources than are either Title I students or Other-CE students in Other-CE schools. Teaching personnel account for a low of 82 percent to a high of 86 percent of total reading program cost. The range is similar, 77 to 88 percent, when each grade level is examined separately as in Tables C-1 to C-6 of Appendix C.

In the instructional support cost (mostly the cost of clerical aides and other support personnel) subtotal, the dollar values, among the three categories of selectees, are quite small ranging from $7 to $17 per student per year on average, with Title I students showing the highest value. The range of instructional support as a percent of total reading cost is quite consistent (2 to 4.1 percent); treating each grade separately, as in Appendix C, the range is 1.7 to 5 percent. Similarly, the cost associated with the use of equipment and materials is lower for Other-CE students in Title I schools than for either of the remaining CE categories. There is no noteworthy difference between Title I students and Other-CE students in Other-CE schools with respect to equipment and materials cost. The range of equipment and materials cost, as a percent of total reading program cost, runs from 11 to 15 percent; treating the data separately for each grade, the range is 10 to 19 percent.

Mathematics Cost. The pertinent data on the cost of the resources used in compensatory mathematics instruction are shown in Table 3-2. The first observation we make is that the cost for students in mathematics is less than the cost for students in reading instruction.

For example, total mathematics program costs for Title I students over all grades is $241, compared to $411 for reading. In each instance, on a grade-by-grade basis, the mathematics program cost is less than the corresponding reading program cost for the three categories of CE selectees (see Tables C-1 through C-12). This result is not surprising.

In comparisons of total program costs across the three categories of CE selectees, a result similar to the one noted in reading emerges. That is, Title I students are offered higher levels of resources than are either of the other two categories of selectees. This is true in all except grade one. However, again the difference appears not to be substantial in comparison to Other-CE students in Other-CE schools; rather the major differences are between Other-CE students in Title I Schools and the other two groups of selectees.

Again, in the mathematics program cost we can see that a similar pattern exists in the division of the total program cost among the three subtotals. Instructional support ranges from 1.7 to 6.2 percent of the total and is again small in magnitude.

The equipment and materials subtotal in mathematics is invariably lower than the values we encountered in reading, with all eighteen instances, as shown in Tables C-7 through C-12 of Appendix C, showing a lower mean cost than the corresponding cost in reading. However, the range of *relative* equipment and materials cost is similar to that of reading – 11.7 to 15 percent of the total program cost pooled over grade levels. As Appendix C illustrates, within grade levels the range is 10 to 16 percent.

Turning to the teaching personnel subtotal we find that Other-CE students in Title I schools have the lowest mean cost among the selectee groups. In four of six grades (see Appendix C), Title I students show the highest average value for this resource category. Teaching personnel in mathematics account for a low of 81 percent of the mathematics cost and a high of 86 percent, with the average within grades being 77 to 89 percent.

DO COMPENSATORY-EDUCATION SELECTEES RECEIVE MORE SERVICES THAN DO NON-SELECTEES?

Having examined the level of resources offered to CE selectees, we may now turn our attention to comparing the level of the resources offered to selectees to that offered non-selectees. Again, Tables 3-1 and 3-2 summarize the relevant data.

Reading Cost. In examining the total reading program cost data in Table 3-1, we may first note that the CE selection category with the lowest overall mean reading program cost (Other-CE students in Title I schools) has a mean cost that exceeds the highest mean value for any of the three categories of non-selectees. This is graphically shown in Figure 3-1. That result, in itself, indicates an affirmative answer to the question that heads this section. In spite of the substantially larger number of students comprising the three non-selectee groups, the mean value for all non-selectees is lower than the grand mean over all students. Over all grades the mean total reading program cost is $391 for selectees and $251 for non-selectees.

More specifically, with respect to Title I schools, if we take the non-CE selectees in Title I schools as a benchmark, then the *difference* in the average total reading program cost between Title I students and their non-selectee peers (in the same schools) is nearly 60 percent of the non-selectee base. The range within grade levels is (Tables C-1 through C-6 of Appendix C) 31 percent to 116 percent of the non-selectee base. Clearly, Title I students are offered substantially more in the way of reading resources than are their non-CE peers.

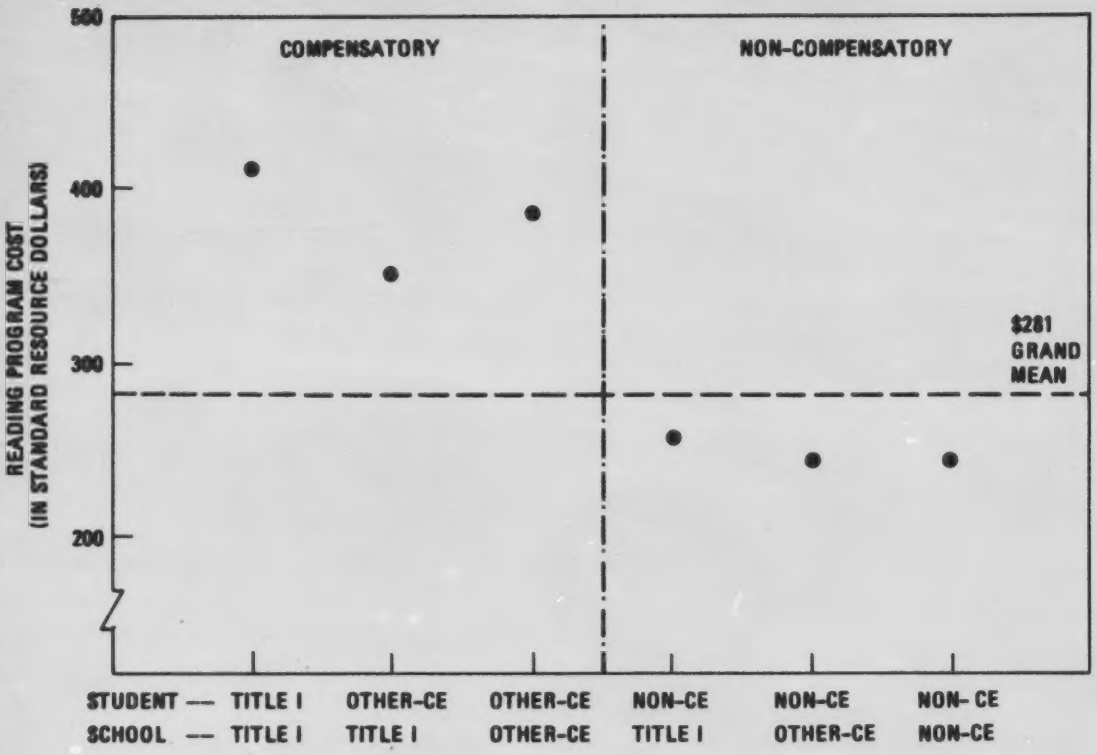

Figure 3-1

Cost of Reading Programs Offered by CE Selection Category

Viewed in terms of the amounts of variance accounted for by the selection category variable, the observed differences in mean total reading program cost are associated with selection category. Selection category accounts for 12 percent of the variance, with the within-grade values being 6 to 21.7 percent.

Similar amounts of variance are accounted for by selection category in the three subtotal breakouts. For teaching personnel, selection category accounts for 3.7 to 15.9 percent of the variance, with the value over all grades being 8.5 percent. In the instructional support area, selection category accounts for 12.4 to 18.9 percent of the variance. In the equipment and material subtotal, selection category accounts for 8.9 to 15.8 percent of the variance. Over all grades, selection category accounts for 14.2 percent and 11.4 percent of the variance is the instructional support and equipment and materials subtotals respectively.

Turning to the *mathematics* data presented in Table 3-2, we again see substantial differences between selectees and non-selectees. As was the case in reading, the highest mean total program cost in any of the three non-selectee groups is lower than the lowest corresponding

value shown among the three selectee groups. This is depicted in Figure 3-2. Again, no non-selectee group exceeds the grand mean over all students. Over all groups, the mean total program cost for selectees is $215, as opposed to $141 for non-selectees, a difference of 51.4 percent. These results also obtain in the within-grade data of Tables C-7 through C-12 in Appendix C.

A direct comparison of Title I students and their non-CE peers in Title I schools further indicates some substantial differences in resource levels (cost) of the mathematics programs offered. The difference in mean total mathematics cost between these two selection categories is 65.1 percent, within-grade the range is 46.6 to 80.6 percent of the total program cost offered the non-CE students in Title I schools.

Examining the mathematics cost data on the basis of the variance accounted for by selection category, we see similar results as were noted in the reading cost data. Selection category accounts for 6.4 to 12.7 percent of the variance in total mathematics program cost, with 9.1 percent being the amount accounted for over all grade levels. Selection category accounts for 3.5 to 8.4 percent of the variance in the subtotal for teaching personnel, with 5.9 percent over all grades. In instructional support, selection category accounts from 12.8 to 21.1 percent of the variance.

Under the equipment and materials subtotal, selection category accounts for 5.2 to 9.9 percent of the variance, with selection category accounting for 6.8 percent over all grades.

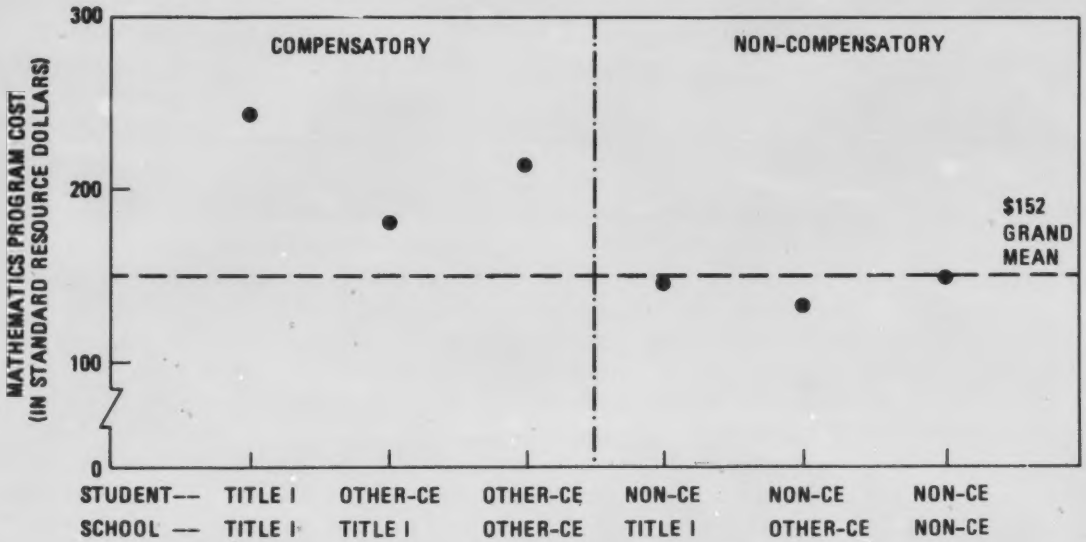

Figure 3-2

Cost of Mathematics Programs Offered by
CE Selection Category — Mean Cost Over Grades

Both our summaries of the reading and mathematics program cost data indicate that CE selectees are offered substantially more resources in their instruction than are their peers. This can be readily seen in Figures 3-3 and 3-4. The striking facts emerging from these data are: first, there is a substantial difference between compensatory and non-compensatory programs and, second, the percentage difference of the compensatory over the regular program increases with grade level.

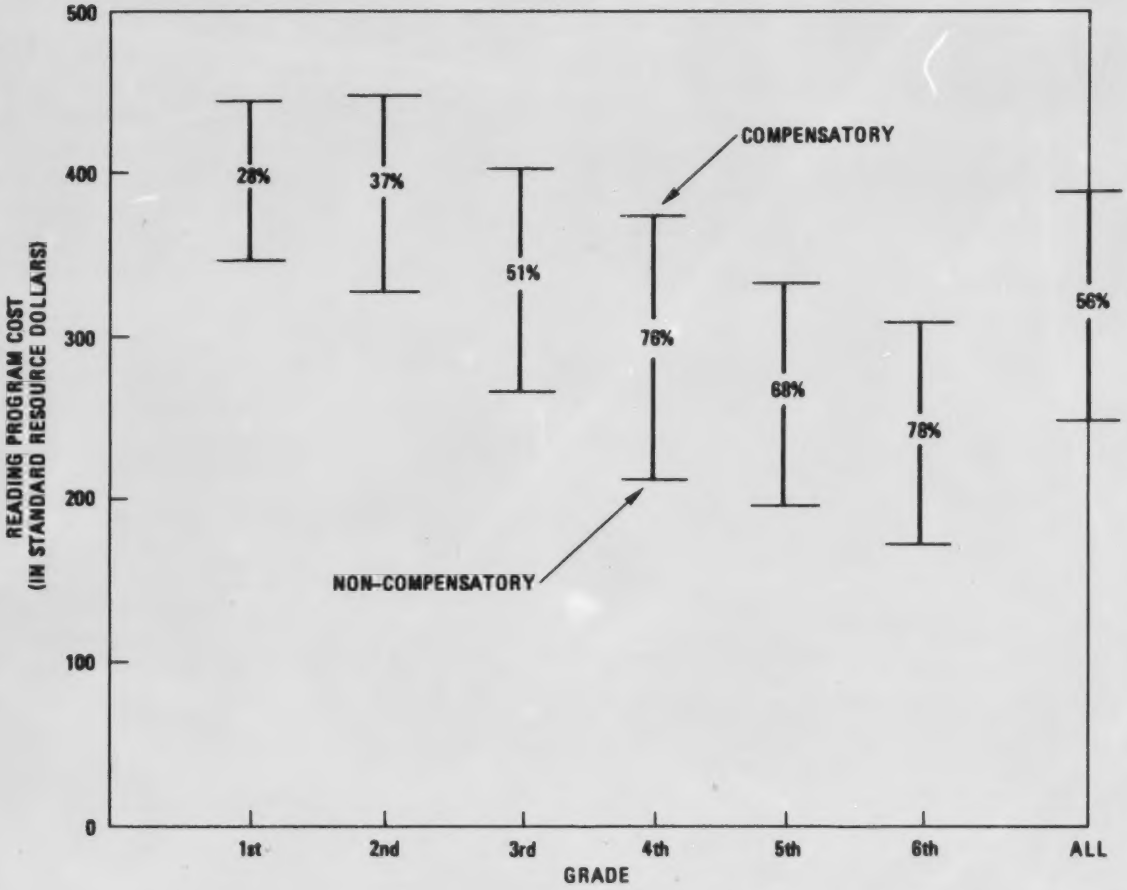

Figure 3-3

Comparison of Compensatory and Non-Compensatory Reading Programs – Mean Program Cost by Grade

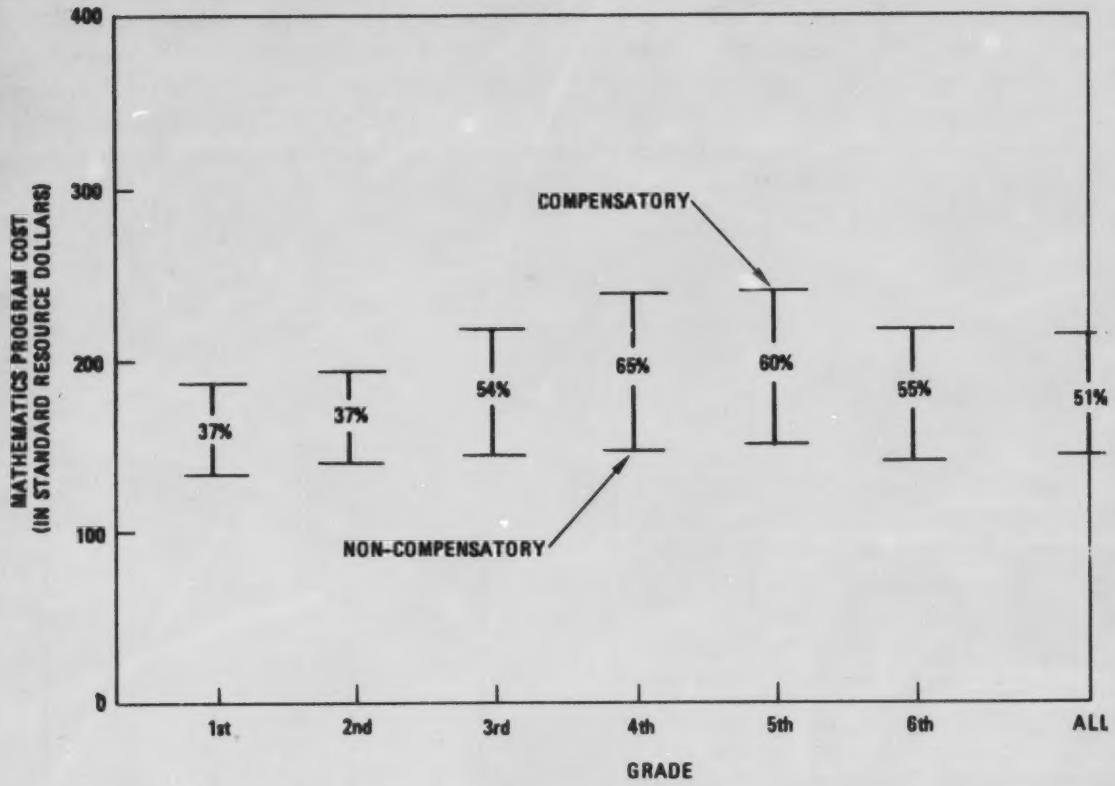

Figure 3-4

Comparison of Compensatory and Non-Compensatory Mathematics Programs — Mean Program Cost by Grade

HOW DOES THE COMPOSITION OF RESOURCES (THE MIX OR COMBINATION) OFFERED TO COMPENSATORY-EDUCATION SELECTEES DIFFER FROM THE COMPOSITION OF RESOURCES OFFERED TO NON-SELECTEES?

Having examined the relative levels of resources offered to CE selectees and non-selectees and having seen that selectees are offered substantially higher levels of resources in both reading and mathematics instruction, we may now attempt to isolate more clearly how those variations in resource level are delivered. In order to address this question, we now examine the program component cost variables in conjunction with the six categories of CE selection. (See the discussion in Chapter 2 on the restructuring of the resource cost variables into the program component cost variables.)

Reading Program Component Cost. We begin this discussion of the program component costs by examining the differences in resource levels offered among the three CE selectee categories. Table 3-3 displays the reading cost data. In Appendix C, Tables C-13 through C-18 display the program component cost data separately for each grade level. Table 3-3 shows both the mean cost for each program component within CE selection category and the percent of total reading program cost accounted for by each program component within selection category. An inspection of Table 3-3 reveals that the most striking locus of difference is in the area of instruction by special reading teachers. In both the Title I and Other-CE in Other-CE schools categories there appears to be a strong emphasis on providing instruction by special reading teachers in medium and small size groups. While students in all three selectee categories are offered special teacher instruction, these two components are substantially less in the Other-CE students in Title I schools category than in either of the other selectee categories. Pooling the data over grade levels, special teacher instruction accounts for 32.6, 17.1, and 27.3 percent of reading cost for the Title I, Other-CE in Title I schools and Other-CE in Other-CE schools, respectively. Among the separate grade levels, special teachers account for 17.9 to 33.9 percent of total reading program cost in the Other-CE in Other-CE schools category. The range for Other-CE students in Title I schools is 10.4 to 23.3 percent. The range for Title I students is 27.7 to 39 percent.

We may now compare the three categories of non-selectees to the three selectee groups. Again adding together the two components that comprise the special reading teacher category, we find that the range of special reading teacher instruction as a percent of total program cost is 17.1 to 32.6 for the CE selectees and 2.5 to 3.9 percent for non-selectees. Treating the data separately by grade, as in Appendix C, Tables C-13 through C-18, the range is 10.4 to 27.7 percent for grade one CE categories; the range is less than 1 to 2.3 percent in the non-CE categories in grade one. In the second grade, the CE range is 15.9 to 32.4 percent; in the non-CE categories it is 1.9 to 3 percent. In the third grade, special reading teacher instruction represents 18.7 to 32.1 percent of program cost; in the non-CE categories the range is 2 to 4 percent. For fourth graders, the range for CE students is 20.3 to 35.1 percent; for non-CE students it is 20.3 to 35.1 percent; for non-CE students it is 2.5 to 4.5 percent. Among fifth graders, special reading teacher instruction accounts for 23.3 to 33.4 percent of program cost in the CE groups; the range is 1.6 to 4.5 percent in the non-CE groups. Finally, in the sixth grade the CE range is 19.7 to 38.0 percent; the non-CE range is 5.4 to 8.2 percent.

One-way ANOVAS of these data indicate that selection category accounts for 8.3 to 15.2 percent of the variance in the special-teacher/medium-group component, and 17.4 to 22.2 percent of the variance in special-teacher/small-group component. These values are 11.2 and 19.3 percent over all grades.

In addition to the special teacher related program components, the teaching assistant/aide component also shows differences between selectees and non-selectees. Selection category accounts for 9.7 percent of the variance over all grades in the cost of that program component, with the range within grade levels being 7.3 to 12 percent.

In examining the data of Table 3-3 further, we note that non-selectees exhibit higher mean costs for instruction by classroom teachers in whole class and large group settings. In terms

Table 3-3

Cost of Reading Program Components Offered to ALL Grades by Student CE Selection Categories (In Standard Resource Dollars)

	Reading CE Selection Category											
	Title I Students in Title I Schools		Other-CE Students in Title I Schools		Other-CE Students in Other-CE Schools		Non-CE Students in Title I Schools		Non-CE Students in Other-CE Schools		Non-CE Students in Non-CE Schools	
	9785 Students		4349 Students		3387 Students		35781 Students		18654 Students		8064 Students	
Reading Program Components	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%
Classroom Teacher												
Whole Class	28	6.8	21	6.0	25	6.5	33	12.8	34	14.0	42	17.2
Large Group	13	3.2	10	2.8	13	3.4	17	6.6	22	9.1	18	7.4
Medium Group	71	17.3	90	25.7	73	19.0	78	30.3	75	31.0	61	25.0
Small Group	117	28.5	121	34.6	123	32.0	83	32.3	68	28.1	85	34.8
Teaching Assistant/Aide												
Small Group	22	5.3	17	4.8	15	3.9	5	1.9	3	1.2	2	0.8
Special Teacher												
Medium Group	29	7.0	10	2.9	17	4.4	2	0.8	2	0.8	2	0.8
Small Group	105	25.6	50	14.3	88	22.9	8	3.1	5	2.0	6	2.4
Tutoring by Student/ Volunteer Adult	1	0.2	1	0.3	1	0.3	<.5	0.1	1	0.4	1	0.4
Independent Study – Programmed	4	1.0	3	0.9	5	1.3	4	1.6	5	2.0	3	1.2
Independent Study	21	5.1	27	7.8	25	6.5	27	10.5	28	11.5	25	10.2
Reading Total Program Cost	411	100.0	350	100.0	384	100.0	257	100.0	242	100.0	244	100.0

of percent of total program cost associated with classroom teacher instruction in whole class and large group sizes, non-selectees receive 12.8 to 17.2 percent of their resources in those two program components, while selectees receive 6 to 6.8 percent of their resources in those components.

Selectees on the other hand, show higher mean costs in reading instruction by classroom teachers in medium and small groups than do non-selectees. However, once these costs are normalized to a percent of total reading program cost within selection category, the selectee range (28.5 to 34.6 percent) is comparable to the range among non-selectees (32.1 to 34.8 percent). Less than 2 percent of the variance is accounted for by selection in all four of the program components under the classroom teacher heading.

There are no noteworthy differences between selectees and non-selectees in the remaining three program components (Tutoring by Student/Volunteer adult and the two independent study components).

We may summarize the reading program component cost data by noting that CE selectees are offered considerably more instruction from special teachers and teaching assistants/aides than are regular (non-CE) education students.

Mathematics Program Components Cost. The program component cost data for mathematics are presented in Table 3-4. Again the detailed tables by grade level are shown in Appendix C (Tables C-19 through C-24). Beginning with CE selectees, we see that the category of Other-CE students in Title I schools is offered less instruction by special teachers than are either Title I students or Other-CE students in Other-CE schools. The percent of total mathematics program costs accounted for by instruction by special teachers is 29.5 for Title I, 12.8 for Other-CE at Title I schools, and 20.7 for Other-CE at Other-CE schools. Separately for the six grades, the percent of total mathematics program costs of special teacher instruction varies from 7.3 to 16.9 percent in the Other-CE students in Title I schools category. The range is 22.8 to 33.3 percent for Title I students, and 11 to 29.9 percent for Other-CE students in Other-CE schools.

We may summarize these data on mathematics costs by again indicating that two of the three CE categories appear to place more emphasis on special teacher instruction than is the case in the third category (Other-CE students in Title I schools).

Comparing the cost data of non-selectees to that of the selectees, the results of our analysis of these data closely parallel the results for reading discussed above. As we have seen, instruction by special teacher accounts for 12.8 to 29.5 percent of total mathematics program cost for selectees, while the range for non-selectee groups is 2 to 4.1 percent of total cost. Examining the data separately by grade level (as in Tables C-19 through C-24 in Appendix C), the range of the two special mathematics teacher program components, as percentages of total program costs, is 7.3 to 22.8 percent among the CE groups in the first grade; the range for the first grade non-CE groups is 1 to 2.2 percent of total program cost. The range among second graders is 7.1 to 30.4 percent for CE students, and 1.1 to 2.7 percent for non-CE students. For the third grade the range of special mathematics teacher instruction is 13.4 to 30 percent of the total for CE students, and 1 to 4.2 percent

Table 3-4

Cost of Mathematics Program Components Offered to ALL Grades by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Components	Mathematics CE Selection Category: Title I Students in Title I Schools, 5296 Students		Other-CE Students in Title I Schools, 3674 Students		Other-CE Students in Other-CE Schools, 2233 Students		Non-CE Students in Title I Schools, 41035 Students		Non-CE Students in Other-CE Schools, 19711 Students		Non-CE Students in Non-CE Schools, 8062 Students	
	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%
Classroom Teacher												
Whole Class	38	15.8	31	17.2	35	16.4	47	32.2	50	37.9	51	34.4
Large Group	14	5.8	14	7.8	8	3.8	12	8.2	12	9.1	12	8.1
Medium Group	28	11.6	28	15.5	32	15.0	19	13.0	18	13.6	18	12.2
Small Group	54	22.4	55	30.6	55	25.8	37	25.3	29	22.0	44	29.7
Teaching Assistant/Aide												
Small Group	17	7.1	9	5.0	14	6.6	3	2.1	1	0.8	1	0.7
Special Teacher												
Medium Group	23	9.6	3	1.7	12	5.6	2	1.4	1	0.8	1	0.7
Small Group	48	20.0	20	11.1	32	15.0	4	2.7	2	1.6	2	1.4
Tutoring by Student/ Volunteer Adult	<.5	0.1	<.5	0.1	1	0.1	<.5	0.2	<.5	0.2	<.5	0.2
Independent Study – Programmed	2	0.8	2	1.0	5	2.3	2	1.4	1	0.8	1	1.4
Independent Study	15	6.2	18	10.0	20	9.4	19	13.0	19	14.4	19	12.8
Mathematics Total Program Cost	241	100.0	180	100.0	213	100.0	146	100.0	132	100.0	148	100.0

for non-CE students. In grade four, the range is 16.9 to 29.2 percent for CE students, and 1.7 to 6.6 percent for non-CE students. In grade five, the range is 16.6 to 33.3 percent and 2.1 percent to 5.9 percent for CE students and non-CE students respectively. Lastly, in grade six, special mathematics teacher instruction accounts for 12.8 to 29.2 percent of total mathematics program cost for CE students and 3.5 to 4.7 percent of the total for non-CE students.

Selection category accounts for 6.2 to 15.3 percent of the variance in special-teacher/medium-group instruction, and for 6.8 to 10.8 percent of the variance in special-teacher/small-group instruction. In both of these components, selection category accounts for 8.7 percent of the variance when the data are pooled over all grades. Selection category also accounts, again, for fairly substantial amounts of the variance in the cost of small group instruction by teaching assistants/aides (13.9 percent over all grades, with a range of 10.8 to 18.8 percent).

Again, in mathematics, non-CE students receive relatively more of their resources in instruction by the classroom teacher in whole class and large group sizes than do CE students. In instruction by classroom teachers occuring in medium and small groups, CE selectees exhibit higher costs than do non-selectees. However, the percent of total costs associated with instruction by the classroom teacher in medium and small groups is fairly constant over all six selection categories. As was the case in reading, the difference between selectees and non-selectees with respect to the two independent study components and the tutoring component are not noteworthy.

WHAT ARE THE COSTS OF COMPENSATORY-EDUCATION SERVICES BY GRADE LEVEL?

The results presented so far have been concerned with the costs of reading and mathematics programs offered to students selected for compensatory education services and with a comparison of compensatory and non-compensatory programs. We have provided the cost data over all grades and have noted, where appropriate, intergrade differences. Here, we focus on grade level findings.

Looking first at the reading program costs shown in Figure 3-5 the general trend is a decrease as the grade level increases. For students selected for reading compensatory education the mean total program cost is $432 for students in the primary grades, and $341 for students in the fourth, fifth and sixth grades. For non-compensatory students the figures are $316 in the primary grades, and $193 in the upper grades. As may be seen in Figure 3-5, the split between the three compensatory and the three non-compensatory selection categories is maintained at all grades.

The mathematics program costs by grade-level present a different picture. In Figure 3-6, the mathematics program costs for compensatory students tend to increase slightly over grades one through four and then decrease. The exception is the category of Title I students in Title I schools; this category of students receives more resources in the fifth grade. For the students in the non-compensatory selection categories, the mathematics program cost is relatively constant for each grade. (The expanded program cost scale used in Figure 3-6

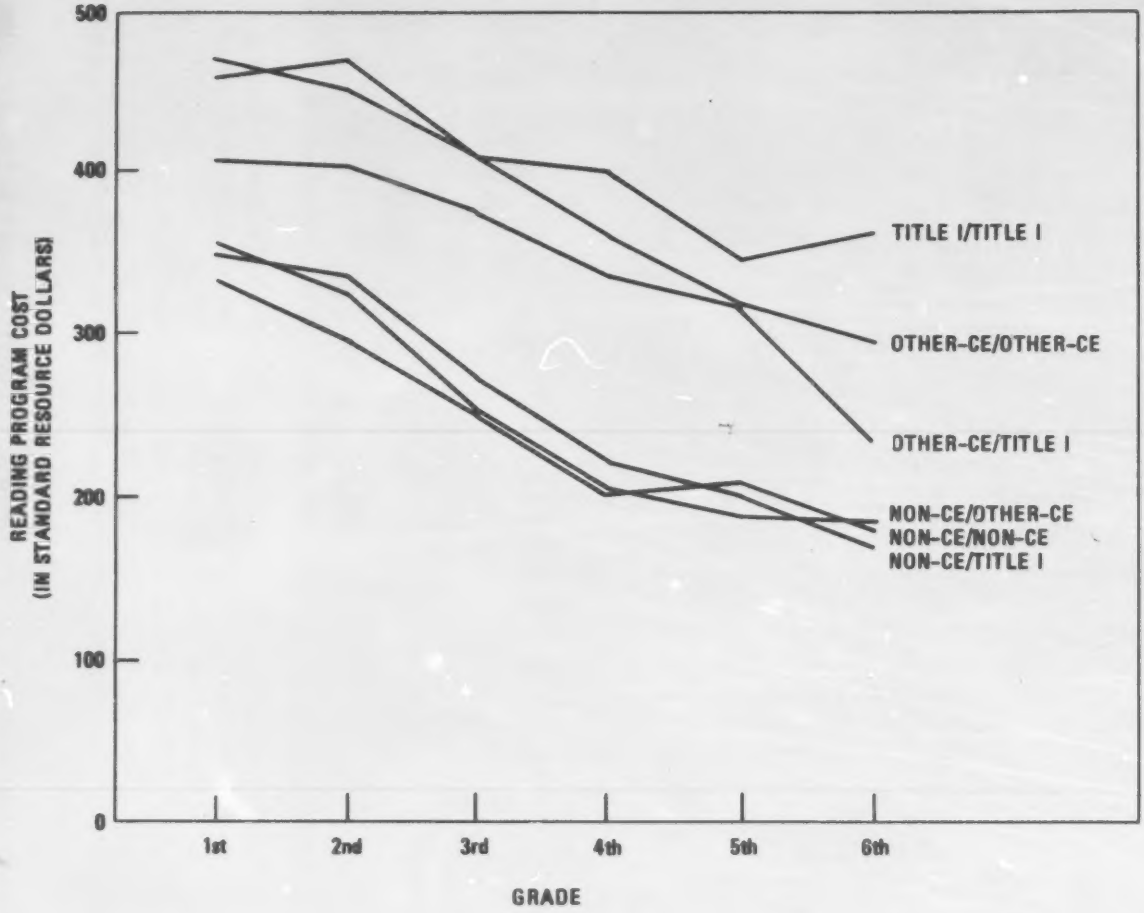

Figure 3-5

Cost of Reading Programs Offered by Grade and CE Selection Category

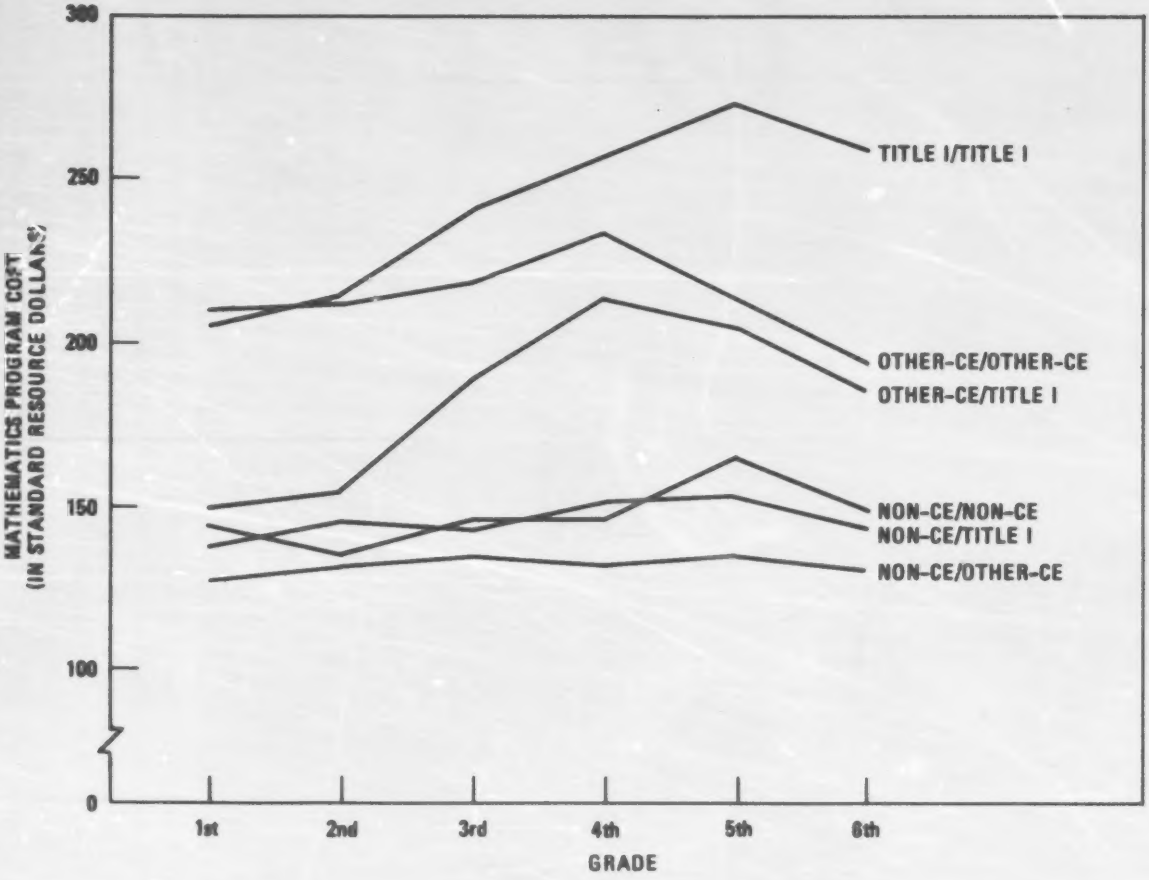

Figure 3-6

Cost of Mathematics Programs Offered by Grade and CE Selection Category

highlights rather insignificant dollar differences in the non-compensatory program costs. These range from a low of only $12 in the third grade to a high of $31 in the fifth grade.)

For students selected for mathematics compensatory education the mean total program cost is $199 for students in the primary grades, and $232 for students in the fourth, fifth and sixth grades. For non-compensatory students the figures are $140 in the primary grades and $145 in the upper grades.

The contrast between reading and mathematics program costs supports the expected findings that more resources are spent in teaching reading and that reading program costs decrease over grade level while mathematics program costs increase slightly over grade level.

SUMMARY

In this chapter we have used the resource and cost data, along with the student CE selection status, in analyses designed to provide information for addressing those policy issues in compensatory education where the amount, and cost, of resources is of interest. The analyses involved first the determining of the costs of the reading and mathematics programs offered to compensatory and to regular students and, second, investigating whether the two types of programs (compensatory and regular) differ in terms of the use of resources and their costs.

We begin this summary with the observation that CE selectees, in general, are offered substantially higher resource levels – and hence more costly programs – than are non-CE students. The reading programs offered CE students cost, on the average, $391 as opposed to $251 for non-CE students, a difference of 56 percent. CE students' mathematics programs cost $215 and the mathematics programs of non-CE students cost $142, a difference of 51 percent. Title I students have an average reading cost of $411 as compared to $257 for non-CE students in Title I schools. The average cost of mathematics for Title I students is $241 as opposed to $146 for non-CE students in Title I schools.

In our analysis of the subtotals of program cost, in both reading and mathematics, we note teaching personnel account for similar percentages of total program costs among both CE and non-CE programs alike. Teaching personnel represent 82 percent to 86 percent of total reading program cost in the CE selectee categories and 85 to 86 percent in the non-CE categories. For mathematics programs, the values are 81 to 86 percent among CE selectee groups and 85 to 87 percent for the non-CE selectee groups.

Although the differences in total program cost (reading and mathematics) between selectees and non-selectees are themselves substantial, we also noted that the more impressive differences occur in specific components of total program cost, namely instruction by special teachers. In the two program components under the heading 'special teacher', 17.1 to 32.6 percent of the cost of their reading programs for selectees is for special teachers. For non-selectees, on the other hand, only 2.5 to 3.9 percent of their program costs are for instruction by special teachers. For mathematics, selectees receive 12.8 to 29.5 percent of their program costs in instruction by special teachers. The values for non-selectees are 2.0 to 4.1 percent.

Among CE selectees, Title I students exhibit the highest average costs in both reading and mathematics and the highest cost for special teachers. Nearly one-third of the program cost for Title I students is for special teachers. This indicates not only that Title I students are offered more resources but also that they are offered more intensive exposure to instructional resources. Instruction by special teachers, as defined in this study, includes a measure of intensity as well as a measure of teacher qualities. Such instruction is provided by special teachers in each subject matter area and takes place in medium and small size groups.

CHAPTER 4. PROGRAM COST IN RELATION TO SELECTED STUDENT CHARACTERISTICS

The data reported in Chapter 3 quite clearly demonstrate that compensatory education students are offered substantially more resources in their reading and mathematics instruction than are students who are not selected to receive compensatory services. The data that were presented in Chapter 3 are the result of the resource approach to estimating educational program costs. The approach used (described in full in Chapter 2) represents one method for assessing the nominal quality of instruction which incorporates both *amount* and *intensity* of instruction.

Although there is no firm base of research that directly leads to the conclusion that the teacher qualities to which we have assigned incremental cost value are related to educational quality, there can hardly be any question that those qualities are directly related to the cost of teachers. In practice, those qualities or characteristics we have so costed e.g. teachers' experience and educational attainment, are determining factors of teacher salary and hence of the relative costs of education.

In this chapter we examine the program cost data in relation to selected student characteristics. The intent is to investigate the extent to which the level of resources offered to students is conditioned upon factors other than student CE selection status. The variables employed were chosen on the basis of their likely relevance to the allocation of educational resources among students. As will be seen, the general results reported in this chapter do not alter the conclusions regarding the differences in resource levels described in Chapter 3.

WHAT ARE THE DIFFERENCES IN THE LEVEL OF SERVICES RECEIVED BY COMPENSATORY EDUCATION SELECTEES AND NON-SELECTEES IN RELATION TO STUDENT CHARACTERISTICS?

Having examined the cost data in relation to student CE selection status, we now present the reading and mathematics program cost data in conjunction with information on other student characteristics in addition to CE selection status. The effect of four additional student characteristics on total program costs for each of the six selection categories were examined. The four characteristics are Student Achievement Level in reading or math, Judgment by Teacher of Need for Compensatory Services, Student Minority Status, and Student Participation in Free or Reduced Price Lunch or Breakfast Programs – a rough indicator of economic status.

During the course of presenting these analyses, we also present data relevant to the question: *What are the resource/cost characteristics of compensatory education in relation to student characteristics?* Cross classifications of the total program cost by student characteristics and CE selection categories are provided for all students, i.e. pooled over grade levels. Appendix D presents similar data separately for each grade level.

OVERALL 'EXPLANATION' OF COST VARIATION ASSOCIATED WITH STUDENT CHARACTERISTICS

The first analysis explored the extent to which these variables 'explain' total program cost variation independently of CE selection status. This was done by examining the adjusted squared *eta* values obtained from two-way analyses-of-variance, where one factor is selection category and the other is one of the student characteristics. The squared adjusted *eta* values computed from the ANOVA results can be interpreted roughly as indicating the percent variation attributed to a particular factor independently of another factor.

Eta values were computed for reading and mathematics for each grade level and over all grade levels and for each of the four student characteristics. Tables of these values are not presented in this report because the results were very uniform. In no case was as much as five percent of the total variation in total program costs accounted for by a student characteristic, other than CE selection category. None accounted for more than half of what was accounted for by selection category, and most accounted for far less.

COST DIFFERENCES ASSOCIATED WITH STUDENT ACHIEVEMENT STATUS

Differences in reading program cost among student achievement levels (expressed as quarters of the achievement distribution based on national norms) are revealed in Table 4-1. We find that in Table 4-1 that the basic relationship among the three groups of CE selectees presented in Chapter 3 holds when we add student achievement status to the analysis. At each quarter of achievement, Title I students and Other-CE students in Other-CE schools exhibit higher mean total reading program cost than do Other-CE students in Title I schools. Again, at each level of achievement, the CE selectee group with the lowest mean cost exceeds the mean cost of non-CE students in Title I schools which is the highest of the three non-CE categories.

We now compare the reading program cost data among achievement quarters. We should note that very few selectees are to be found in the upper two quarters of the achievement distribution, making comparisons among achievement quarters rather tenuous. In the Title I selectee category, 16 percent of the students are in the upper two quarters of reading achievement (above the national average); among Other-CE students in Title I schools, and Other-CE students in Other-CE schools, the percentages of students in the upper two quarters of reading achievement are 33 and 23 percent respectively. These data indicate that CE services are directed toward students in need of them.

The data of Table 4-1 indicate that lower-achieving students are offered higher reading resource levels than are higher-achieving students. One exception to this result occurs among Other-CE students in Title I schools. In that category, students in the highest quarter of reading achievement show a very slightly higher cost than do students in the lowest achievement quarter; the difference is not of practical significance, however.

On a grade-by-grade basis (Appendix D, Tables D-1 through D-6), with the exception of the first grade Title I group and three non-CE groups in grade one, in all cases students in the lowest quarter of the achievement distribution are offered more resources than are students

Table 4-1

Cost of Reading Programs by CE Selection Categories and Student Achievement Level – ALL Grades (in Standard Resource Dollars)

Reading Achievement Level	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	411	195	5247	380	191	1639	389	186	1549	285	162	7042	268	152	2670	279	168	1774
Second Quarter	419	210	2799	357	197	1169	385	188	978	265	157	7848	250	142	3602	261	157	1739
Third Quarter	408	209	867	313	153	706	377	190	403	241	144	8936	234	131	4862	221	145	1857
Highest Quarter	402	210	669	309	159	693	394	196	364	250	152	10619	235	139	7122	223	145	2470

in the highest quarter of the achievement distribution (within selection category). Generally, the difference in cost between upper and lower achievement levels increases with grade level, across all categories of CE selection status.

Table 4-2 presents the average total *mathematics* cost for each quarter of the achievement distribution. Comparing across selection categories and pooling over grade, we note that the pattern is similar to that found in the reading data. Namely, the basic relationship among the three selectee groups holds, as does the overall relationship of selectees to non-selectees. Again, Other-CE students at Title I schools exhibit the lowest means of the three selectee groups, as well as a higher mean cost than all of the non-selectee groups. The percentage of higher achieving students (those in the upper two quarters of the distribution), although still low, is higher in each of the three selectee groups than was the case in reading: 21 percent of Title I selectees, 39 percent of Other-CE students in Title I schools, and 29 percent of Other-CE students in Other-CE schools.

The grade-by-grade data (as shown in Tables D-7 through D-12 of Appendix D) indicate that the costs among achievement quarters again tend to decrease as achievement increases within each selection category.

To summarize, lower achieving students are generally offered higher levels of resources than are higher achieving students, in both reading and mathematics. Lower-achieving selectees are offered substantially more resources than are similarly achieving non-selectees.

COST DIFFERENCES ASSOCIATED WITH TEACHER JUDGMENTS OF STUDENT NEED FOR CE SERVICES

Average total *reading* costs within selection categories and levels of student achievement status are presented in Table 4-3 for students judged by their teachers to be in need of CE services and for students judged *not* to be in need of CE services. Appendix D, Tables D-13 through D-19, supplies supporting data, pooled over grade levels as well as separately, by grade, showing quarters of the achievement distribution.

In every instance in Table 4-3 students who are judged to be in need of CE services are offered higher levels of resources than are students in the same selection category and achievement level who are judged *not* to be in need of CE services. This relationship appears stronger among selectees in Title I schools. Among Title I selectees and Other-CE selectees in Other-CE schools, those who are above the 50th percentile in reading achievement, and who are also judged to be in need of CE services by their teachers, are offered more resources in reading than lower achieving students in need of CE. However, if we pool over the levels of the judgment variable, we find, as was the case in our previous analysis, that the lower achieving students exhibit higher reading costs than do students whose achievement levels are higher. These differences are, however, quite small ($413 vs. $406 in Title I selectee group and $385 vs. $381 in the Other-CE in Other-CE schools group). Title I students in need of CE, ignoring achievement status, have a mean reading cost of $424, while Title I selectees not in need of CE have a mean reading cost of $318.

The preponderant majority of Title I selectees are either at or below the 50th percentile in reading achievement (83 percent) or are judged by their teacher to be in need of CE services

Table 4-2

Cost of Mathematics Programs by CE Selection Categories and Student Achievement Level – ALL Grades (in Standard Resource Dollars)

Mathematics Achievement Level	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	255	140	2548	203	122	1124	224	105	905	162	104	8143	141	74	3159	172	125	1699
Second Quarter	242	132	1386	177	90	845	213	99	560	145	84	8371	132	66	3624	146	101	1636
Third Quarter	227	125	626	169	89	628	208	93	308	141	77	9105	131	64	4635	143	100	1858
Highest Quarter	207	119	401	161	85	633	199	71	285	140	78	10753	129	64	6811	137	85	2303

Table 4-3

Cost of Reading Programs by Student Achievement Level, CE Selection Categories And Teacher Judgment of Need for CE Services – ALL Grades
(In Standard Resource Dollars)

School, Selection Category, Teacher Judgment	N	ACHIEVEMENT LEVEL: 50th Percentile or Below Mean	N	% of Total*	Above 50th Percentile Mean	N	% of Total*
TITLE I SCHOOLS							
Title I – Needed	8,549	421	7,395	76	445	1,154	12
Title I – Not Needed	1,154	334	786	8	284	368	4
Total	9,703						
Other-CE – Needed	2,469	395	2,026	47	369	443	10
Other-CE – Not Needed	1,835	314	861	20	283	974	23
Total	4,304						
Non-CE – Needed	8,875	291	6,754	19	292	2,301	7
Non-CE – Not Needed	26,486	258	9,008	26	240	17,478	49
Total	35,361						
OTHER-CE SCHOOLS							
Other-CE – Needed	2,502	389	2,105	63	430	397	12
Other-CE – Not Needed	837	366	463	14	329	374	11
Total	3,339						
Non-CE – Needed	3,072	270	2,190	12	259	882	5
Non-CE – Not Needed	15,361	249	4,255	23	232	11,106	60
Total	18,433						
NON-CE SCHOOLS							
Non-CE – Needed	2,073	298	1,623	20	261	450	6
Non-CE – Not Needed	5,889	247	1,999	25	218	3,890	49
Total	7,962						

*Percentage of total students in the selection category.
(Rounded to nearest whole percentage.)

(87 percent). Three-quarters of the 16 percent of Title I selectees above the 50th percentile in reading achievement are, themselves, judged to be in need of CE services by their teachers. Only four percent of Title I selectees are both not in need of service and in the upper half of the achievement distribution.

Among Other-CE selectees in Title I schools, lower achieving students exhibit higher reading costs than higher achieving students, and those in need show higher costs than those not in need. Twenty-three percent of these students are neither judged in need of CE nor are they in the lower half of the achievement distribution in reading. Non-CE selectees in Title I schools whose teachers judge them to be in need of CE services show no practical cost difference on the basis of achievement level. Non-CE selectees in Title I schools who are not in need of CE services show a cost difference favoring low achieving students. Twenty-six percent of the non-selectees in Title I schools are judged to be in need of CE services by their teachers; 19 percent of non-selectees are also at or below the 50th percentile in reading achievement.

In the Other-CE schools, as we noted, lower-achieving students judged in need of service show a lower reading cost than higher achieving students in need of CE. Among non-selectees in Other-CE schools, lower-achieving students are offered higher resource levels than higher achieving students, as are students in need of service within both levels of achievement. Seventeen percent of these non-selectees are judged to need CE service.

In non-CE schools, the rank order of mean costs are lower-achieving-in-need, higher-achieving-in-need, low-achieving-not-in-need, and higher-achieving-not-in-need. Twenty percent of the students in non-CE schools are both judged to be in need and are at or below the 50th percentile.

Mathematics program cost data are displayed in Table 4-4. Supporting data may be found in Appendix D, Tables D-20 through D-26. As was the case in reading, Table 4-4 shows that, in all cases, students who are judged to be in need of CE services are offered higher resource levels than are students in the same selection category and achievement level who are judged *not* to be in need of CE services. The magnitude of difference again appears to be largest among Title I students. In all selection categories, students in the lower half in achievement have higher average costs than those students in the upper half of the achievement distribution.

The mean program cost in mathematics for Title I selectees who are at or below the 50th percentile is $248, as opposed to $218 for those above the 50th percentile. For those Title I selectees who are in need of service, the mean cost in mathematics is $252, and for those not in need of CE services the mean cost is $177.

Title I students in mathematics who are either at or below the 50th percentile in mathematics achievement, or judged to be in need of CE service by their teacher, is 86 percent of the category total. Only five percent of Title I selectees are neither in need nor in the lower half of the achievement distribution. All other selection categories exhibit a higher percentage of selectees who are both not in need of service and who are in the upper half on the achievement variable.

Table 4-4

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories And Teacher Judgment of Need for CE Services – ALL Grades (In Standard Resource Dollars)

School, Selection Category, Teacher Judgment	N	ACHIEVEMENT LEVEL: 50th Percentile or Below Mean	N	% of Total*	Above 50th Percentile Mean	N	% of Total*
TITLE I SCHOOLS							
Title I – Needed	4,523	256	3,678	70	234	845	16
Title I – Not Needed	723	184	470	9	165	253	5
Total	5,246						
Other-CE – Needed	2,132	201	1,593	44	178	539	15
Other-CE – Not Needed	1,503	162	648	18	154	855	24
Total	3,635						
Non-CE – Needed	13,350	160	9,645	24	155	3,705	10
Non-CE – Not Needed	27,211	144	9,785	24	137	17,426	43
Total	40,561						
OTHER-CE SCHOOLS							
Other-CE – Needed	1,516	219	1,246	57	215	270	12
Other-CE – Not Needed	677	208	330	15	193	347	16
Total	2,193						
Non-CE – Needed	4,083	145	2,822	14	137	1,261	7
Non-CE – Not Needed	15,398	131	4,759	24	128	10,639	55
Total	19,481						
NON-CE SCHOOLS							
Non-CE – Needed	2,088	180	1,532	19	154	556	7
Non-CE – Not Needed	5,889	144	2,128	27	138	3,761	47
Total	7,977						

*Percentage of total students in the selection category. (Rounded to nearest whole percentage.)

Non-selectees in Title I schools show a relatively high percentage of students whose teachers judge them to be in need of CE service (34 percent); 24 percent of non-selectees in Title I schools are both in the lower half of the achievement distribution and in need of CE on the basis of teacher judgment. That is the highest percent of lower-achieving, needy non-selectees occuring in any of the school categories.

In both the reading cost data and in the mathematics cost data, students who are either lower-achieving or judged by their teacher to need CE service, or both, are offered more resources. These differences do not, however, appear to be as substantial as the differences among the selection categories themselves.

COST DIFFERENCES ASSOCIATED WITH MINORITY STATUS

Reading costs, by average total, are contrasted in Table 4-5 within selection categories for minority and non-minority students. The data indicate, among CE selectee groups, that non-minority students are offered higher resource levels in both the Title I and in the Other-CE in Other-CE schools selection categories. The differences are 8 and 13 percent respectively. In the other four selection categories, minority students are offered higher levels of reading resources. These differences range from slightly more than five percent in the Other-CE students in Title I schools to 26 percent in the non-CE schools.

Examining the data of Table 4-5 across all six selection categories, we note that minority selectees are offered considerably higher resource levels in reading than are minority non-selectees. In Title I schools, for example, minority Title I selectees are offered 43 percent more resources than are minority non-selectees in Title I schools. We also note that among minority students in Title I schools, 28 percent receive Title I services in reading (with an additional 11 percent receiving Other-CE reading services in Title I schools); among non-minority students in Title I schools, 16 percent receive Title I services and eight percent receive Other-CE services in Title I schools.

In the cost data, treated separately by grade in Appendix D, Tables D-27 through D-32, we see that, among the three selectee groups, ten of the eighteen comparisons show higher average costs for non-minority students. The magnitude of these differences favoring non-minority students ranges from less than one percent (Other-CE in Title I Schools, grade four) to nearly 37 percent (in the grade one Title I selectee group). In the eight comparisons that favor minority students, the range is 1.9 percent (Other-CE at Other-CE Schools, grade five) to 76.4 percent (non-CE at non-CE Schools, grade six). The more substantial differences favoring *non-minority* students occur in the selectee categories in the lower grades; the more substantial differences favoring *minority* students occur at the upper grade levels among non-selectees.

In summarizing the reading costs, we may note that the differences among the selection categories are larger than those between minority and non-minority students within selection categories.

Mathematics costs, pooled over grade levels, are shown in Table 4-6. The average costs for minority students exceeds those for non-minority students in all selection categories except Other-CE students at Title I schools, where the average for non-minority students is 2.2 percent higher.

Table 4-5

Reading Program Cost by CE Selection Categories and Student Minority Status – ALL Grades (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	396	182	4278	362	161	1695	358	160	1239	277	157	9092	263	139	2835	290	168	1784
Non-Minority	427	216	5222	344	198	2467	405	203	2007	251	153	24933	239	140	15200	230	147	5972

Table 4-6

Mathematics Program Cost by CE Selection Categories and Student Minority Status – ALL Grades (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	260	136	2988	179	89	1212	230	101	939	160	103	9843	148	79	2885	183	140	1694
Non-Minority	220	127	1923	183	110	1979	202	93	1079	141	78	26055	129	63	15114	138	87	5717

In the mathematics data presented separately by grade level (Appendix D, Tables D-33 through D-38), all but two of the comparisons favor minority students, the exceptions being Other-CE students in Title I schools, grade four, and Other-CE students in Other-CE schools, also grade four. With the exception of these two results, average differences in total cost favoring minority students tend to increase with increasing grade level for both selectees and non-selectees.

Among minority students in Title I schools, those receiving Title I services in mathematics are offered much more resources than are minority students who do not receive CE services ([illegible]0 vs. $160). In the sample, 28 percent of the minority students in Title I schools receive Title I services in mathematics; six percent of the non-minority students in Title I schools receive Title I mathematics services.

By way of summary, we note that in mathematics, as in reading, the larger cost differences occur in the selectee-non-selectee comparisons than occur in the minority-majority comparisons.

COST DIFFERENCES ASSOCIATED WITH STUDENT PARTICIPATION IN FREE OR REDUCED PRICE LUNCH/BREAKFAST PROGRAMS

The last student characteristic we examine is participation in free or reduced price meals. This variable is included to provide some indication of student economic status. The reading program cost data pooled over grades are shown in Table 4-7. Among all six selection categories, only the category Other-CE students in Other-CE schools shows a clear difference favoring students who do *not* participate in such meal programs. Among Title I students the means are virtually equal. The largest relative difference favoring participants is 17 percent in the non-CE schools category.

Treating the data separately be grade levels (Appendix D, Tables D-39 through D-44), among the selectee categories, Title I students who participate in meal programs show lower average costs than non-participants in meal programs in the first three grades, with the reverse being the case in the upper three grades. For Other-CE students in Title I schools, only the second grade data deviate from a pattern of an increasing difference favoring the participating group; in grade two, the difference very slightly favors non-participating students. Among Other-CE students in Other-CE Schools, the average costs for non-participating students are higher in all but the fifth grade, with the size of the difference largest in grades two and four.

The average reading program costs in all three non-selectee categories exhibit a similar pattern of differences. In grade one this favors non-participating students. Grade two, for non-CE students in Other-CE Schools is also favored, while all other grades show differences favoring participants.

The pattern of average *mathematics* costs, pooling the data over grades (Table 4-8), is one of higher values for participating students in all categories of selectees and non-selectees.

Table 4-7

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — ALL Grades (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	414	211	3439	334	190	1658	403	202	1791	250	152	21399	239	141	14461	233	152	5718
Participate	413	197	6061	363	180	2504	368	170	1455	272	158	12626	256	135	3574	273	159	2038

Table 4-8

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program – ALL Grades (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	216	125	1377	178	99	1376	203	90	1005	139	76	21911	131	67	14347	145	98	5485
Participate	256	138	3534	184	106	1815	226	104	1013	158	99	13987	138	66	3652	160	116	1926

Among selectees, the data by grade level (Appendix D, Tables D-45 through D-50), indicate higher average values for participating students in all three categories of CE selectees, with two exceptions (Other-CE students at Other-CE schools in grade four and Other-CE students at Title I schools, where the difference is quite small). The largest differences occur among Title I students in grades four through six, reaching 36 percent in the sixth grade.

In the non-selectee categories, with one exception, the pattern is one of small to moderately higher average costs for participating students.

As has been typical in the data presented in this chapter, the cost differences between the levels of the student characteristic variable, that is students who participate in meals program and those who do not participate in such programs, are substantially less pronounced than are the differences in program cost among the selection status categories. This is the case for both the reading and the mathematics costs.

SUMMARY

The intent of this chapter was to examine further the program cost data in relation to four student characteristics in addition to CE selection status. The purpose being to attempt to ascertain whether the differences in program costs among the six selection categories may be conditioned upon those other student characteristics. The four characteristics are: student achievement status, teacher judgment of need for CE services, student minority status, and participation in free or reduced price meals program. The general conclusion we have reached in this chapter is that *none of the student characteristics are as strongly related to program cost as is selection category*. As noted, none of the four student characteristics variables accounted for more than half as much of the amount of variation in program costs as is accounted for by selection category.

To review the results briefly, students who are lower achieving (at or below the 50th percentile in achievement), and students who are judged by their teachers to be in need of CE services, are offered higher resource levels than are higher achieving students and students judged not to be in need of CE services. Focusing on Title I students, those in the lower half of the achievement distribution have slightly higher costs than those in the upper half of the achievement distribution. Title I students who need CE services (as judged by their teachers) have substantially higher reading costs ($424 vs. $318) and mathematics costs ($252 vs. $177) than do Title I students not judged to need CE services.

We have also seen that very few Title I selectees are both in the upper half of the achievement distribution and judged not to be in need of CE services (4 percent in reading and 5 percent in mathematics). Other CE programs – whether in Title I schools or in schools not having Title I – exhibit substantially higher percentages of students who are neither in the lower half of the achievement distribution nor judged in need of CE services.

In comparing the program cost data of minority and non-minority students, the results indicate that, in reading, non-minority selectees are offered higher resource levels in two of the three categories of selectees (including the Title I category). In those two categories, the differences are 8 and 13 percent above the reading program costs of minority students. However, if we compare minority Title I students to minority non-CE students in Title I schools we see a rather large difference indicating higher resource levels in reading for minority selectees ($396 vs. $277 or 43 percent). In mathematics, (with the exception of Other-CE students in Title I schools), minority students are offered higher resource levels than are non-minority students. Minority Title I students have higher mathematics costs than do either non-minority Title I students or minority non-CE students in Title I schools.

In examining the program cost data in terms of whether students participate in free or reduced price meals programs, the results in reading show no strong differences. In mathematics, the differences, although small, favor participants in meals programs.

APPENDIX A
RESOURCE DATA COLLECTION AND THE RESOURCE COST MODEL

This appendix has two purposes: one is to present a brief summary of the on-site resource data collection conducted in March and April of 1977, the second is to provide additional details on the resource cost model (RCM) used in estimating the reading and mathematics program costs for each of the 80,000 students.

RESOURCE DATA COLLECTION

In March and April of 1977, RMC Research staff visited a 45-school sample of the SES schools to obtain data on the types and amounts of resources typically available for use in elementary instruction for grades one through six. We included equipment and materials which, though centrally stored, could be used by the classroom teachers. We visited a subsample of SES schools, using the Cost Data Interview Guide (CDIG) as a checklist for the data we were to collect.

The Cost Data Interview Guide. The CDIG was designed to provide information about resource availability in elementary schools. The CDIG had two sections. Section A, administered to the district business manager, requested information on the district's budget, salary schedule, and demographics. Section B, administered to the principal and his staff at the sample schools, was used to record information on school size, availability of instructional equipment, reading and mathematics materials, and the size of libraries and resource centers, if applicable. We also had a pre-priced list of equipment, against which we checked the prices paid by the districts for the items. The specific item prices were used to estimate the price of the similar-use groups of equipment (sound equipment or sound projector groups) typically used in the classroom.

The data obtained were analyzed to develop the equipment and materials price information needed for the RCM. The salary schedules were used to construct the standard teacher salary schedule for use in the RCM.

The CDIG Subsample and Its Selection. The site visit sample of schools was selected to reflect a wide range of resource availabilities and resource-use patterns, and a reasonable degree of representativeness of the prevailing salary structures.

In order to get the necessary range and representativeness needed for the RCM, a sample of schools, stratified on three dimensions, was selected. The sampling strata were chosen on the basis of the likelihood that, in combination, they would also provide the needed range of characteristics of schools and districts that are of interest to the cost and cost/effectiveness analyses.

The three stratifying dimensions were as follows: poverty status of the LEA, size of LEA, and school size. The three-way stratification was applied to the representative sample of

schools which had a full complement of grades one through six. The first two stratifications were used in selecting the schools in the SES samples. School size was added as the third stratification in selecting the schools in the CDIG sample.

The rationale for adding school size was based on the idea that the size of the school's enrollment is very likely to have an impact upon the organizational structure of the school's administration. The organizational structure of the school, in turn, can be hypothesized as affecting the delivery of educational services to students. School size seems very likely to be closely related to the resource-use pattern of a given school. Larger schools tend to be more resource rich, in terms of both staff and equipment. For example, school size is expected to have a significant impact on the availability and utilization of central resources and specialist instruction.

The three-way stratification as described implies a 27-cell sampling matrix. For the **Representative Sample**, one site was selected from each of the 27 cells. An additional eight sites were selected from the combination high *vs* low poverty strata, LEA size, and school size dimensions of the sampling matrix, thus bringing the total to 35 sites. This sampling procedure was followed within the constraint that all regions of the nation be represented in the site-visit sample. HEW regional representativeness was maintained with three or four schools in each region. In addition to these 35 schools, five schools *each* from **Comparison** and **Nominated Samples** were also selected.

The 45 sites selected offered a sufficient guarantee that the site visit sample would provide the full range of resource-use patterns needed to support the pricing algorithms. The purposes of including schools from the **Comparison** and **Nominated Samples** were to ensure maximum variation in resources used and to ensure that schools from these samples were represented in the site-visit sample.

Prices for Resource-Use. The RCM requires prices for each *resource-use.* Several pricing algorithms were designed as the means for constructing these prices. The pricing algorithms develop the price data for their associated quantity measures of resource-use. Various pricing algorithms by type of resource variable (staff, equipment, materials, school-wide resource facilities and instructional support services) are then used to develop the price of each resource-use.

The resource-availability data for the pricing algorithms were obtained through site visits to a subsample of the SES schools. In turn, these data from the subsample of site-visited schools provide the basis for developing the price inputs for all the schools in the SES sample, using their measures of use. That is, the average price values resulting from the analysis of the data will be used as the price factors for estimating the cost per use for all schools in the SES.

The products of the pricing algorithms are the standard prices for comparable resources. These prices may be of two types: the price of a single unit of resource – teacher salary, etc., and the price that is related to the level of use for a particular type of resource – the cost of using sound equipment four times a week, etc. Different pricing algorithms are used to develop the price for staff salaries and the prices for the other resource elements of equipment, materials and the different categories of direct instructional support.

Teacher Standard Salary Schedule. The standard salary schedule was constructed from the average of the salary schedule information from the 45 CDIG sites. The standard salary schedule matrix has cells for six education levels and for eight values for years of experience. The details of the standard salary schedule are presented later in the discussion of the resource cost model.

Using the standard teacher salary schedule and the reported teacher salary data from the SES overall sample of teachers, we constructed an index of actual teacher salary *vs* the SES standard salary. (We do not use this index in our calculations of student program cost, but, because the findings are interesting, we include the results.)

On a teacher-by-teacher basis, the actual salary as a percentage of the standard salary is the teacher salary index for an individual teacher. The mean of the indices provides the teacher salary index for the school. The distribution by number of schools is shown in Table A-1.

The teacher salary index by the ten HEW regions is shown in Table A-2. There are no surprises: Region IX, the Pacific Southwest, is highest with an index of 1.17 and Region IV, the Southeast, is lowest with an index of 0.77.

DETAILS OF THE RESOURCE COST MODEL

The RCM is the basis upon which the student cost variables were obtained. This discussion is addressed primarily to the operational and processing activities of the RCM. Its purpose is to provide, in some detail, information on the internal workings of the RCM.

A brief statement of the conceptual basis of the model used to generate the cost (C) of a students's instructional program for reading or mathematics is:

$$C = P * Q$$

Where P = price per unit of resource-use

Q = the quantity of use of the resource

In order to operationalize this basic model, the quantity factor (Q) must be adjusted for four additional factors, such that the model is rewritten as:

$$C = P * Q * L * S * T * A$$

Where L = a *length* factor that adjusts all costs to a yearly basis

S = a *size* factor that distributes shared resources from the class level to the student level

T = a *time* factor that accounts for the proportion of the school day allocated to reading and math respectively

Table A-1

Distribution of Schools by Teacher Salary Index

Index Range	Number of Schools
1.35 or more	6
1.34 – 1.30	4
1.29 – 1.25	4
1.24 – 1.20	7
1.19 – 1.15	12
1.14 – 1.10	16
1.09 – 1.05	24
1.04 – 1.00	39
0.99 – 0.95	24
0.94 – 0.90	42
0.89 – 0.85	30
0.84 – 0.80	24
0.79 or less	10

Table A-2

Teacher Salary Index by HEW Region

	HEW Region	Index = Actual Salary / SES Standard Salary
I	New England	1.01
II	Metropolitan Northeast	1.08
III	Mid-Atlantic	1.08
IV	Southeast	0.77
V	North Midwest	0.98
VI	South Central	0.91
VII	Central Midwest	0.91
VIII	North Central	0.80
IX	Pacific Southwest	1.17
X	Pacific Northwest	1.05

A = an *attendance* factor that accounts for the proportion of the school year a student actually attends

(The attendance factor (A) is only used in Technical Report #6 to adjust the amount of instruction attended to the amount offered. In the cost-effectiveness analyses to be reported in Technical Report #7, the attendance factor is used to adjust all individual student cost estimates to reflect actual exposure to resources.)

There are four sections in the discussion of the RCM. Each describes the operation of a stage in the model. (The discussion uses reading instruction as the basis for tracing through the model.) The first describes the process of linking students to their respective teachers. This linking stage forms the basis for assigning costs to each of the students based upon the student's instructional program. The next two describe the construction of the resource/cost variables and the price and quantity factors used. The final section outlines the data processing elements of the model. It includes the flow chart of all the pre-processing and processing activities, and the descriptions of the five computer programs that are used in calculating the resource cost and program component cost variables.

Student/Teacher Linkage. Each student in the Sustaining Effects Study is linked to a range of from one-to-three reading teachers and to a similar range of from one-to-three math teachers. These teachers are classified as regular or special teachers. Three sources of information are used: the Student/Teacher Linkage Roster (STLR), Item 1 of Teacher Questionnaires B and C (TQBØ1, TQCØ1), and the instructional time a student receives from the regular classroom teacher and a special teacher, as reported on the Student Participation and Attendance Record (SPAR and SPAM). The essential task of the linkage decision rules is to determine the student's regular classroom teacher, or teachers, and the student's special reading teacher. (These statements of linkage cover all the possible links and are too numerous to include here.)

The STLR lists up to three reading teachers for each student. It does not distinguish between regular and special teachers, but denotes them as follows:

READØØ1 – The first named reading teacher on the STLR
READØØ2 – The second named reading teacher on the STLR
READØØ3 – The third named reading teacher on the STLR

If the homeroom teacher (teacher of record) provides reading instruction to his students, he will be the first named reading teacher. On Item 1 of TQB (TQBØ1) the reading teachers indicate whether they are:

(1) a regular classroom teacher

(2) a special reading teacher who provides instruction to students during the regular reading period for their class

(3) a special reading teacher whose instruction is provided in addition to the instruction his students receive during their regular reading period

This information is used to classify a student's regular and special reading teachers.

Instructional Time with Teaching Personnel. The SPAR specifies how much instructional time a student received from a regular classroom teacher and how much from a special reading teacher. The student level SPAR information is given preference in the linkage process, regardless of how a teacher described himself on TQBØ1 (regular, special providing, or special).

The following variables are defined based on *each student's SPAR* information:

READREG = YREADA + YREADB + YREADC + YREADD

where YREADA. . .D is the amount of instructional *time* in reading in *each delivery configuration* related to the classroom teacher.

READSPEC = YREADE + YREADF

where YREADE. . .F is the amount of instructional *time* in reading in *each delivery configuration* related to the special reading teacher.

Based on these two variables, READCODE is defined as follows:

READCODE = Ø if READSPEC = Ø, READREG ≠ Ø
1 if READREG = Ø, READSPEC ≠ Ø
2 if READREG ≥READSPEC, READSPEC ≠ Ø, READREG ≠ Ø
3 if READREG <READSPEC, READSPEC ≠ Ø, READREG ≠ Ø

If both READREG and READSPEC are zero, it is assumed that the student does not have a reading teacher.

The values of the READCODE and the STLRCODE determine which teachers are classified as the student's special reading teachers. Under this classification there may be from zero to three *regular* reading teachers ascertained, and from zero to three *special* reading teachers ascertained.

Construction of the Resource Cost Variables. The reading resource cost variables are shown in Table A-3. Each variable has a precise cost equation that identifies the appropriate quantities of resource-use and price per use factors. The cost equation also specifies the length of time the resource is used and the size of the group, if allocation to the individual student is needed.

Price Factors for Reading Resource Cost Variables. Some price factor values depend on the salary of the teachers linked to the student. The teacher's salary in dollars per instructional hour is a function of the teacher's years of experience and the highest degree earned. These salary values are given in Table A-4, below. The salaries shown in this table were obtained from an analysis of the 1976-77 teacher salary schedules reported for forty-five schools. Each cell entry represents the average hourly pay rate based on 1260 hours per year and a 14% fringe benefit factor.

Table A-3

Reading Resource Cost Variables

Variable Name	Variable Description
TEACHING PERSONNEL	
RRT21	Classroom teacher instruction in reading to groups of 21 or more
RRT14	Classroom teacher instruction in reading to groups of 14 to 20 students
RRT07	Classroom teacher instruction in reading to groups of 7 to 13 students
RRT02	Classrrom teacher instruction in reading individually or to groups of 2 to 6 students
RST07	Instruction to groups of 7 or more students by a special reading teacher
RST02	Instruction individually or to groups of 2 to 6 students by a special reading teacher
RRA02	Individual or group (2 to 10 students) instruction by a paid aide or teacher assistant
RRTIT	Reading tutoring – other student, volunteer
RRTIP	Independent reading, programmed materials
RRTIO	Independent reading
INSTRUCTIONAL SUPPORT PERSONNEL	
RRCOO	Clerical aide support to the classroom teacher for reading instruction
RSCOO	Clerical aide support to the special reading teacher
RSAOO	Instruction by a paid aide or teaching assistant under the supervision of the special reading teacher
RDISO	Other personnel resources used as a direct support to reading instruction
EQUIPMENT	
RREIO	Individually used instructional equipment for reading supervised by the classroom teacher
RREGO	Instructional equipment used by the classroom teacher to provide reading instruction to groups of students
RSEIO	Individually used instructional equipment under the supervision of the special reading teacher
RSEGO	Instructional equipment used by the special reading teacher to provide instruction to groups of students
MATERIALS	
RRMOO	Instructional materials for reading used by the classroom teacher
RSMOO	Instructional materials used by the special reading teacher
TOTAL	
RTPC	Total reading program cost

Table A-4

Teacher Salary Matrix

Highest degree earned	Years of Experience 1	2	4	8	13	18	23	28
No degree or diploma based on less than four years work	6.60	7.00	7.40	8.20	8.70	8.80	8.90	9.00
Bachelor's degree	8.00	8.70	9.40	10.70	11.80	12.00	12.20	12.30
Bachelor's degree plus fifth-year preparation	8.50	9.20	9.90	11.30	12.60	12.90	13.10	13.20
Master's degree	9.00	9.70	10.40	11.90	13.50	13.70	13.90	14.00
Six-year specialist degree	9.40	10.20	10.90	12.50	14.30	14.60	14.80	14.90
Doctorate	9.90	10.70	11.40	13.00	14.70	15.00	15.20	15.40

The price factors for instructional aides and other instructional support personnel depend on the average hourly wage data obtained for the schools in the site-visit sample. For instructional aides the price was found to be $4.29, including fringe benefits. The price factors for instructional support personnel are calculated from the salary information obtained from the forty-five school CDIG samples. The hourly rates are shown in Table A-5.

The price factors for the various categories of equipment and materials, shown in Tables A-6 and A-7, were developed in accordance with the following procedures.

Table A-5

Instructional Support Personnel Price Factors

P_RRC00	=	3.84	Clerical Aide
P_RSC00	=	3.84	Clerical Aide
P_RSA00	=	4.29	Teaching Assistant/Aide
P_RDIS01	=	12.87	Psychologist
P_RDIS02	=	10.64	Media Specialist

Table A-6

Equipment Price Factors – Reading

P_RREI01	=	1.17	Sound equipment
P_RREI02	=	1.41	Individual viewers
P_RREI03	=	0.92	Sound projectors
P_RREI04	=	1.58	Feedback teaching machines
P_RREI05	=	1.00	Study carrels
P_RREI06	=	2.49	Special reading machines
P_RREG01	=	11.71	Sound equipment
P_RREG02	=	11.69	Projectors
P_RREG03	=	9.19	Sound projectors
P_RREG04	=	2.49	Special reading machines
P_RREG05	=	5.71	Television
P_RSEI01	=	1.17	Sound equipment
P_RSEI02	=	1.41	Individual viewers
P_RSEI03	=	0.92	Sound projectors
P_RSEI04	=	1.58	Feedback teaching machines
P_RSEI05	=	1.00	Study carrels
P_RSEI06	=	2.49	Special reading machines
P_RSEG01	=	11.71	Sound equipment
P_RSEG02	=	11.69	Projectors
P_RSEG03	=	9.19	Sound projectors
P_RSEG04	=	2.49	Special reading machines
P_RSEG05	=	5.71	Television

Table A-7

Materials Price Factors – Reading

P_RRM001	=	8.70	Textbooks
P_RRM002	=	9.50	Supplementary readers
P_RRM003	=	4.57	Free reading book
P_RRM004	=	12.66	Reference book
P_RRM005	=	24.51	Workbooks, dittos
P_RRM006	=	4.52	Games, puzzles
P_RRM007	=	23.65	Publisher kits
P_RSM001	=	8.70	Textbooks
P_RSM002	=	9.50	Supplementary readers
P_RSM003	=	4.57	Free reading book
P_RSM004	=	12.66	Reference book
P_RSM005	=	24.51	Workbooks, dittos
P_RSM006	=	4.52	Games, puzzles
P_RSM007	=	23.65	Publisher kits

The site-visit (CDIG) data base was used to generate a combined CDIG sample inventory cost-per-year for each category of equipment and materials. Combined inventory cost (for each category) was then distributed among the pattern-of-use response items contained in Teacher Questionnaires B and C. This was accomplished by scaling the questionnaire response items to a use-per-month basis. Next, each scaled response score was weighted by the respective number of CDIG sample teachers responding, thus:

$$\text{Combined Inventory Cost} = N_1S_1P + N_2S_2P + N_3S_3P$$

where N_1, N_2, and N_3 are the response frequencies, and S_1, S_2, and S_3 are the scaled response values.

Solving for P obtains the price-per-year for a use-pattern of one use per month.

The outcome of the procedure just described is a series of price factors for equipments and materials. The Resource-Cost Model (RCM) uses these price factors in combination with the teacher responses from the entire SES sample to generate a cost-per-year for each level of use. These costs are then converted, using the size factor (S), to a per-student cost per year.

Quantity Factors for Reading Resource Cost Variables. The quantity factors for the reading resource cost variables depend on the weeks in attendance and the weeks in the school year. For instructional support personnel the quantity factors are hours per week for, say, clerical aides for the first, second, and third regular/special reading teachers linked to the student.

The calculation of a reading quantity factor for equipment or materials depends on two variables. These variables, the responses on Teacher Questionnaire B for the reading teachers linked to the student, are given in Table A-8. The other quantity factors are calculated in the same manner.

The Data Processing Elements of the RCM. The flow chart of the RCM is followed by brief descriptions of the five computer programs that make up the RCM. The two output files of the RCM provide each individual student's reading and mathematics program cost.

Table A-8

Reading Quantity Factors – Equipment and Materials

Quantity Factors	Teacher Questionnaire B Variables	Description
Q_RREI01, Q_RSEI01	TQB027A, TQB028A	Sound equipment usage
Q_RREI02, Q_RSEI02	TQB027B, TQB028B	Individual viewer usage
Q_RREI03, Q_RSEI03	TQB027C, TQB028C	Sound projector usage
Q_RREI04, Q_RSEI04	TQB027D, TQB028D	Feedback teaching machines
Q_RREI05, Q_RSEI05	TQB027E, TAB028E	Study carrels
Q_RSEI06, Q_RSEI06	TQB027F, TQB028F	Special reading machines
Q_RREG01, Q_RSEG01	TQB025A, TQB026A	Sound equipment usage
Q_RREG02, Q_RSEG02	TQB025B, TQB026B	Projector usage
Q_RREG03, Q_RSEG03	TQB025C, TQB026C	Sound projector usage
Q_RREG04, Q_RSEG04	TQB025D, TQB026D	Special reading machines usage
Q_RREG05, Q_RSEG05	TQB025E, TQB026E	Television usage
Q_RRM001, Q_RSM001	TQB029A, TQB029H	Textbook usage
Q_RRM002, Q_RSM002	TQB029B, TQB029I	Supplementary reader usage
Q_RRM003, Q_RSM003	TQB029C, TQB029J	Free reading book usage
Q_RRM004, Q_RSM004	TQB029D, TQB029K	Reference book usage
Q_RRM005, Q_RSM005	TQB029E, TQB029L	Workbook/ditto usage
Q_RRM006, Q_RSM006	TQB029F, TQB029M	Game, puzzle usage
Q_RRM007, Q_RSM007	TQB029G, TQB029N	Publisher kits

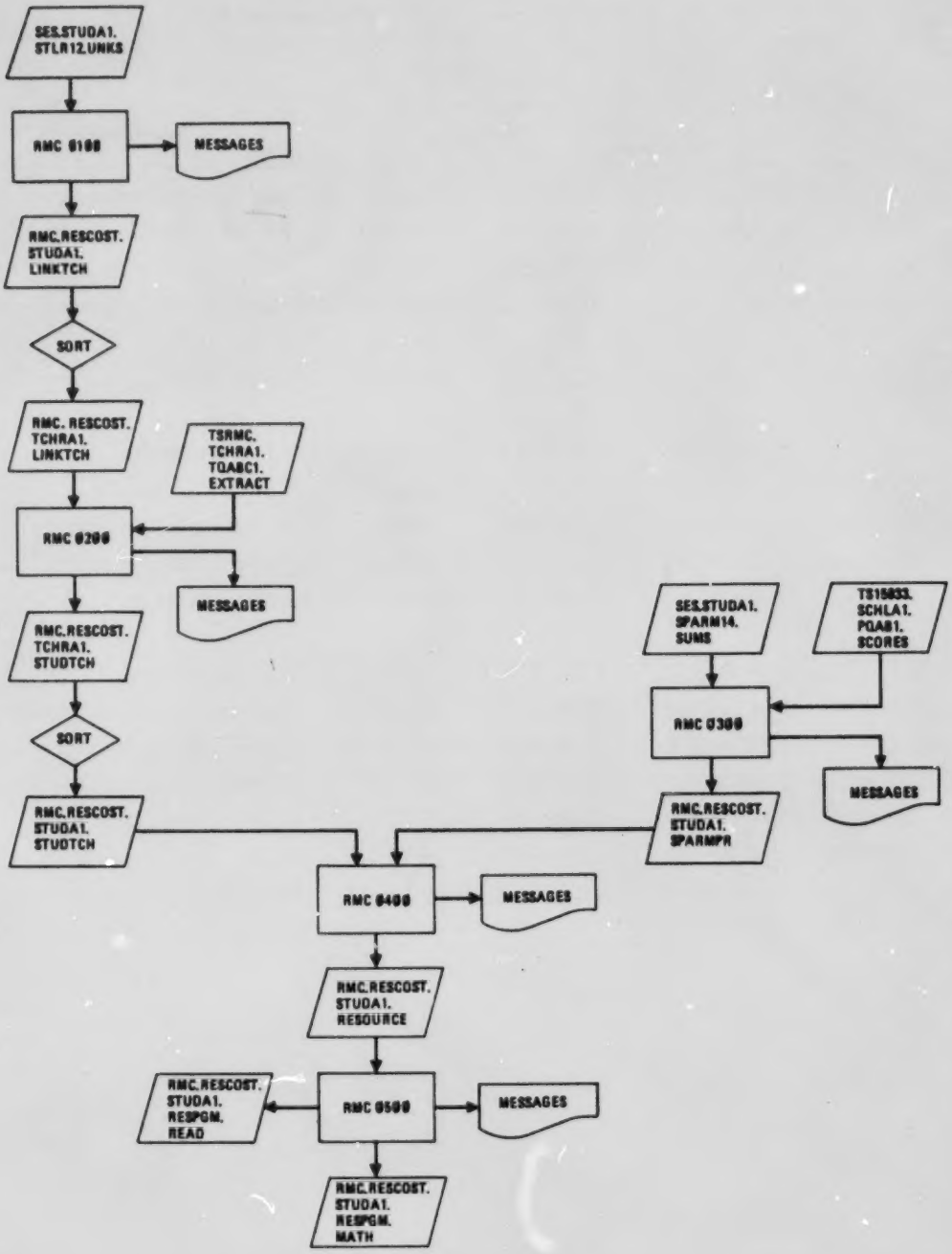

Figure A-1. Resource Cost Model: Flow Chart

PROGRAM: RMC0100

PURPOSE: TO GENERATE FROM THE STUDENT/LINKAGE ROSTER FILE, RECORDS THAT CAN BE MATCHED BY TEACHER ID AGAINST THE TEACHER EXTRACT FILE.

INPUT: STUDENT/TEACHER LINKAGE ROSTER FILE
(SES.STUDA1.STLR12.LINKS)
SORTED BY SCHOOL AND STUDENT ID

OUTPUT: TEACHER LINKAGE FILE
(RMC.RESCOST.STUDA1.LINKTCH)
SORTED BY SCHOOL AND STUDENT ID

PRINT FILE
LIST COUNTERS

DESCRIPTION: FOR EACH TEACHER SPECIFIED ON THE STUDENT/TEACHER LINKAGE ROSTER FILE, ONE TEACHER LINKAGE RECORD IN CREATED.

TYPETCH = 0 FOR ALL READING TEACHERS
= 1 FOR ALL MATH TEACHERS

NAMEDTCH = 1 FOR THE FIRST NAMED TEACHER
= 2 FOR THE SECOND NAMED TEACHER
= 3 FOR THE THIRD NAMED TEACHER

ERROR MESSAGES:
NONE

PROGRAM: RMC0200

PURPOSE: TO OBTAIN TEACHER INFORMATION RELATING TO INDIVIDUAL STUDENTS.

INPUT: TEACHER LINKAGE FILE
(RMC.RESCOST.TCHRA1.LINKTCH)
SORTED BY SCHOOL AND TEACHER ID NUMBER

OUTPUT: STUDENT TEACHER FILE
(RMC.RESCOST.TCHRA1.STUDTCH)
SORTED BY SCHOOL AND TEACHER ID NUMBER

PRINT FILE
LIST ERROR MESSAGES AND COUNTERS

DESCRIPTION: THE TEACHER LINKAGE FILE AND THE TEACHER EXTRACT FILE ARE MATCHED ON SCHOOL AND TEACHER ID NUMBER. FOR EACH TEACHER LINKAGE RECORD THAT HAS A MATCHING TEACHER RECORD, A STUDENT TEACHER RECORD IS PRODUCED. IF TYPETCH ON THE TEACHER LINKAGE RECORD WAS '0', THE READING INFO IS USED. IF IT WAS '1', THE MATH INFO IS USED.

ERROR MESSAGES:
ERROR 201 LINKED TEACHER IS NOT ON TEACHER FILE
ERROR 202 TEACHER FILE END BEFORE END OF LINKAGE

PROGRAM: RMC0300

PURPOSE: TO GENERATE A FILE CONTAINING INFORMATION FROM THE SPARM FILE AND THE PRINCIPAL FILE.

INPUT: SPARM FILE
(SES.STUDA1.SPARM14.SUM)
SORTED BY SCHOOL AND STUDENT ID

PRINCIPAL FILE
(TS15933.SCHLA1.PQAB1.SCORES)
SORTED BY SCHOOL AND STUDENT ID

OUTPUT: COMBINED SPARM AND PRINCIPAL FILE - SPARMPR FILE
(RMC.RESCOST.STUDA1.SPARMPR)
SORTED BY SCHOOL AND STUDENT ID

PRINT FILE
ERROR MESSAGES AND COUNTERS

DESCRIPTION: INPUT FILES ARE MATCHED ON SCHOOL AND STUDENT ID. FOR EACH MATCH A SPARMPR RECORD IS CREATED. UNMATCHED RECORDS ARE LISTED AS ERRORS.

ERROR MESSAGES:
ERROR 301 SCHOOL AND SPARM, NOT ON PRINCIPAL
ERROR 302 SCHOOL ON PRINCIPAL, NOT ON SPARM
ERROR 303 SPARM ENDED BEFOR PRINCIPAL
ERROR 304 PRINCIPAL ENDED BEFORE SPARM

PROGRAM: RMC0400

PURPOSE: THIS PROGRAM COMBINES INFORMATION FROM
(1) SPARMPR FILE
THIS FILE CONTAINS INFORMATION FROM
THE SPARM FILE AND THE PRINCIPAL FILE
(2) STUDTCH FILE
THIS FILE CONTAINS INFORMATION FROM
THE STUDENT LINKAGE FILE AND THE TEACHER
EXTRACT FILE

INPUT: SPARM-PRINCIPAL FILE
(RMC.RESCOST.STUDA1.SPARMPR)
SORTED BY SCHOOL, STUDENT ID

STUDENT TEACHER FILE
(RMC.RESCOST.STUDA1.STUDTCH)
SORTED BY SCHOOL, STUDENT ID

OUTPUT: RESOURCE FILE
(RMC.RESCOST.STUDA1.RESOURCE)
SORTED BY SCHOOL, STUDENT ID

PRINT FILE
LISTS ERRORS AND COUNTERS

DESCRIPTION: INPUT FILES ARE MATCHED ON SCHOOL, STUDENT NUMBER. ALL MATCHING RECORDS ARE COMBINED TO PRODUCE ONE RESOURCE RECORD.
UNMATCHED RECORDS ARE LISTED AS ERRORS.
IF REGULAR AND SPECIAL READING TIME = ZERO, ALL READING VALUES ARE TREATED AS MISSING VALUES.
IF REGULAR AND SPECIAL MATH TIME = ZERO, ALL MATH VALUES ARE TREATED AS MISSING VALUES.

ERROR MESSAGES:
ERROR 401 STUDENT NUMBER NOT ON STUDENT LINKAGE
ERROR 402 STUDENT NUMBER NOT ON SPARMPR
ERROR 403 REGULAR AND SPECIAL READING TIME = ZERO
ERROR 404 REGULAR AND SPECIAL MATH TIME = ZERO
ERROR 405 MISSING TEACHER INFORMATION - READING
ERROR 406 MISSING TEACHER INFORMATION - MATH
ERROR 407 NO READING TEACHERS FOR STUDENT
ERROR 408 NO MATH TEACHERS FOR STUDENT

PROGRAM: RMC0500

PURPOSE: THIS PROGRAM CREATES THE RESOURCE-PROGRAM FILES
FROM THE STUDENT RESOURCE FILE.

INPUT: RESOURCE FILE
(RMC.RESCOST.RESOURCE)
SORTED BY SCHOOL, STUDENT ID

OUTPUT: READING RESOURCE-PROGRAM FILE
(RMC.RESCOST.STUDA1.RESPGM.READ)
SORTED BY SCHOOL, STUDENT ID

MATH RESOURCE-PROGRAM FILE
(RMC.RESCOST.STUDA1.RESPGM.MATH)
SORTED BY SCHOOL, STUDENT ID

PRINT FILE
LISTS COUNTERS

DESCRIPTION:
SALARY MATRIX IS INITIALIZED.
NUMBER OF WEEKS IN THE SCHOOL YEAR IS DETERMINED
BY THE VALUE OF PQB003.
WEEKS IN SCHOOL YEAR AND ATTEND ARE STORED IN
OUTPUT RECORDS.

PRICE FACTORS ARE DETERMINED.
QUANTITY FACTORS ARE DETERMINED.
LENGTH FACTORS ARE DETERMINED.
SIZE FACTORS ARE DETERMINED.
TIME FACTOR IS DETERMINED.

RESOURCE VARIABLES ARE CALCULATED.
PROGRAM VARIABLES ARE CALCULATED.

ERROR MESSAGES:
NONE

APPENDIX B
PROGRAM COST BY RESOURCE COST VARIABLE

The total and subtotal program costs for reading and mathematics instruction are used in the analyses of Chapter 3. The twenty resource cost variables comprising a student's program cost are aggregated by three subtotals (Teaching Personnel, Instructional Support and Equipment/Materials) to provide a manageable information base for the analysis of the research questions.

The examination of the resource cost variables supports the findings of the earlier analyses but adds additional insights about the type and quantity of resources used in providing compensatory and regular instruction. The instructional program costs by resource cost variables is presented in Tables B-1 through B-7, for reading programs, and in Tables B-8 through B-14 for mathematics programs.

Table B-1

Cost of Reading Programs Offered to ALL Grades by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 9785 Students		Other-CE Students in Title I Schools 4349 Students		Other-CE Students in Other-CE Schools 3387 Students		Non-CE Students in Title I Schools 35781 Students		Non-CE Students in Other-CE Schools 18654 Students		Non-CE Students in Non-CE Schools 8046 Students	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	19	31	15	24	16	26	23	33	24	32	30	37
14 to 20 students	10	26	8	26	9	26	12	30	16	42	14	33
7 to 13 students	58	69	75	79	56	72	65	79	63	82	51	75
2 to 6 students	106	149	111	155	111	153	76	137	61	130	77	142
Special Teacher												
7 or more students	16	32	7	23	10	26	1	9	1	8	2	11
2 to 6 students	86	122	44	104	74	125	7	39	4	24	5	32
Teaching Assistant/Aide (Regular Teacher)	16	26	12	21	9	17	4	13	2	11	2	7
Student Tutor/Volunteer Adult	1	2	1	3	1	3	<.5	2	1	3	1	3
Independent Study—Programmed	4	9	3	8	5	13	4	10	5	13	3	9
Independent Study	21	17	27	21	25	18	27	21	28	21	25	19
Clerical Aide Support												
Regular Teacher	2	4	3	2	2	4	1	3	1	2	1	3
Special Teacher	6	12	<.5	4	3	8	<.5	3	<.5	3	<.5	3
Teaching Assistant/Aide (Special Teacher)	5	9	1	4	2	6	<.5	2	<.5	1	<.5	2
Other Personnel Support	3	6	3	6	3	6	2	4	2	5	1	4
Instructional Equipment with Regular Teacher												
Individual Use	10	17	6	9	12	15	o	12	6	10	6	10
Group Use	3	4	3	3	4	4	3	3	3	3	3	3
Instructional Equipment with Special Teacher												
Individual Use	8	14	2	7	6	13	<.5	3	<.5	3	<.5	2
Group Use	2	3	1	2	2	3	<.5	1	<.5	1	<.5	1
Instructional Material Use												
Regular Teacher	25	12	24	13	26	15	23	11	23	14	23	10
Special Teacher	11	14	4	9	9	14	<.5	4	<.5	3	<.5	4
Total Program Cost	411	202	350	184	384	188	257	154	242	140	244	155

Table B-2

Cost of Reading Programs Offered to First Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 1698 First Graders		Other-CE Students in Title I Schools 841 First Graders		Other-CE Students in Other-CE Schools 554 First Graders		Non-CE Students in Title I Schools 6727 First Graders		Non-CE Students in Other-CE Schools 2862 First Graders		Non-CE Students in Non-CE Schools 1319 First Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	22	33	19	26	12	21	24	34	23	31	36	56
14 to 20 students	10	29	11	37	5	17	12	34	15	43	11	27
7 to 13 students	65	68	88	77	66	81	102	91	102	101	91	80
2 to 6 students	140	163	149	179	198	201	112	164	118	181	111	163
Special Teacher												
7 or more students	15	35	5	20	7	20	1	6	1	6	<.5	3
2 to 6 students	84	130	31	82	59	116	7	36	3	19	3	17
Teaching Assistant/Aide (Regular Teacher)	21	31	21	26	12	19	8	21	4	15	4	11
Student Tutor/Volunteer Adult	1	3	2	4	1	2	1	3	1	5	2	5
Independent Study – Programmed	4	12	2	6	5	12	4	11	5	15	1	6
Independent Study	26	19	29	23	33	20	35	24	39	24	36	23
Clerical Aide Support												
Regular Teacher	3	4	3	5	1	3	2	4	1	3	1	3
Special Teacher	5	11	<.5	2	2	7	<.5	2	<.5	1	<.5	1
Teaching Assistant/Aide (Special Teacher)	3	8	1	4	1	5	<.5	2	<.5	1	<.5	1
Other Personnel Support	3	6	2	5	3	5	1	3	2	5	<.5	2
Instructional Equipment with Regular Teacher												
Individual Use	10	15	8	11	14	16	8	12	9	14	7	9
Group Use	4	3	4	4	5	4	4	3	4	3	4	3
Instructional Equipment with Special Teacher												
Individual Use	7	12	1	5	4	9	<.5	3	<.5	1	<.5	2
Group Use	2	3	<.5	1	1	3	<.5	1	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	26	10	25	11	31	15	26	9	27	11	25	8
Special Teacher	10	14	3	9	8	13	<.5	3	<.5	2	<.5	2
Total Program Cost	459	226	405	197	469	209	349	155	355	156	332	147

Table B-3

Cost of Reading Programs Offered to Second Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 1831 Second Graders		Other-CE Students in Title I Schools 846 Second Graders		Other-CE Students in Other-CE Schools 607 Second Graders		Non-CE Students in Title I Schools 5547 Second Graders		Non-CE Students in Other-CE Schools 2487 Second Graders		Non-CE Students in Non-CE Schools 1169 Second Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	15	28	17	30	12	21	24	39	19	31	17	25
14 to 20 students	7	25	6	24	11	32	11	33	19	40	19	37
7 to 13 students	74	78	95	82	72	86	91	95	97	99	92	93
2 to 6 students	132	186	128	190	141	162	116	186	88	174	80	124
Special Teacher												
7 or more students	18	33	5	17	6	17	2	10	1	5	<.5	5
2 to 6 students	96	134	49	114	93	133	7	41	4	29	7	34
Teaching Assistant/Aide (Regular Teacher)	16	26	15	22	9	15	5	14	5	18	2	7
Student Tutor/Volunteer Adult	1	3	1	3	1	4	1	3	1	3	1	4
Independent Study–Programmed	4	11	2	9	4	10	5	14	5	14	2	7
Independent Study	23	18	32	22	30	22	33	23	40	25	35	19
Clerical Aide Support												
Regular Teacher	2	4	3	4	2	3	2	3	1	2	2	4
Special Teacher	7	13	1	4	1	6	<.5	3	<.5	2	<.5	1
Teaching Assistant/Aide (Special Teacher)	5	9	1	4	1	5	<.5	2	<.5	1	<.5	1
Other Personnel Support	4	6	4	6	3	6	2	4	3	6	1	3
Instructional Equipment with Regular Teacher												
Individual Use	10	16	7	10	15	17	8	11	9	11	7	9
Group Use	4	4	3	3	5	4	3	3	4	4	3	3
Instructional Equipment with Special Teacher												
Individual Use	9	16	2	6	6	12	<.5	4	<.5	2	<.5	3
Group Use	2	3	1	2	2	3	<.5	1	<.5	<.5	<.5	1
Instructional Material Use												
Regular Teacher	26	11	26	9	28	14	26	9	26	14	26	9
Special Teacher	12	15	5	10	9	13	1	4	<.5	3	<.5	3
Total Program Cost	469	234	402	196	451	182	336	181	324	153	296	132

Table B-4

Cost of Reading Programs Offered to Third Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 1880 Third Graders		Other-CE Students in Title I Schools 729 Third Graders		Other-CE Students in Other-CE Schools 556 Third Graders		Non-CE Students in Title I Schools 5359 Third Graders		Non-CE Students in Other-CE Schools 2557 Third Graders		Non-CE Students in Non-CE Schools 1248 Third Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	18	29	10	17	20	33	20	32	21	32	23	26
14 to 20 students	8	21	6	20	11	28	12	27	26	70	14	32
7 to 13 students	59	69	78	83	54	72	67	73	73	92	56	72
2 to 6 students	106	141	118	134	125	156	84	132	60	123	101	145
Special Teacher												
7 or more students	17	30	6	18	11	30	1	7	1	4	1	4
2 to 6 students	80	110	56	123	86	138	8	44	4	28	6	28
Teaching Assistant/Aide (Regular Teacher)	18	26	14	23	12	19	4	12	1	4	4	10
Student Tutor/Volunteer Adult	1	3	<.5	2	<.5	1	<.5	2	<.5	4	<.5	2
Independent Study– Programmed	3	8	4	9	3	13	3	9	4	11	1	3
Independent Study	21	16	32	22	25	15	31	21	29	21	30	17
Clerical Aide Support												
Regular Teacher	2	4	3	5	3	4	2	3	1	2	1	3
Special Teacher	6	12	1	4	4	10	<.5	3	<.5	1	<.5	1
Teaching Assistant/Aide (Special Teacher)	5	9	1	3	1	5	<.5	3	<.5	<.5	<.5	<.5
Other Personnel Support	4	8	3	6	2	4	2	6	1	3	1	3
Instructional Equipment with Regular Teacher												
Individual Use	11	14	8	10	11	16	8	11	7	9	6	7
Group Use	4	4	3	3	4	3	3	3	3	2	3	3
Instructional Equipment with Special Teacher												
Individual Use	10	15	2	7	5	10	<.5	3	<.5	1	<.5	1
Group Use	2	3	1	2	1	3	<.5	1	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	25	13	24	9	25	13	24	11	25	14	25	9
Special Teacher	12	14	4	8	7	12	1	4	<.5	2	<.5	3
Total Program Cost	411	182	374	163	411	204	272	134	256	135	271	151

Table B-5

Cost of Reading Programs Offered to Fourth Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 1602 Fourth Graders		Other-CE Students in Title I Schools 690 Fourth Graders		Other-CE Students in Other-CE Schools 534 Fourth Graders		Non-CE Students in Title I Schools 5722 Fourth Graders		Non-CE Students in Other-CE Schools 2726 Fourth Graders		Non-CE Students in Non-CE Schools 1217 Fourth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	19	32	12	22	16	23	21	32	23	33	35	32
14 to 20 students	13	30	5	20	11	27	14	29	21	46	19	34
7 to 13 students	55	69	73	79	51	64	52	68	54	69	36	52
2 to 6 students	91	134	103	147	77	115	58	113	37	84	49	117
Special Teacher												
7 or more students	13	29	7	21	12	25	2	11	1	7	<.5	2
2 to 6 students	88	112	51	106	82	133	7	38	3	24	6	39
Teaching Assistant/Aide (Regular Teacher)	13	20	8	18	9	18	2	8	1	8	<.5	1
Student Tutor/Volunteer Adult	<.5	2	<.5	1	1	3	<.5	2	<.5	1	<.5	1
Independent Study--Programmed	4	9	2	6	7	16	3	8	5	13	2	6
Independent Study	20	17	26	22	23	17	23	16	24	17	23	14
Clerical Aide Support												
Regular Teacher	2	3	2	4	2	4	1	2	1	2	1	2
Special Teacher	7	13	1	4	4	9	<.5	3	<.5	1	<.5	1
Teaching Assistant/Aide (Special Teacher)	6	9	1	4	3	7	<.5	3	<.5	1	<.5	1
Other Personnel Support	4	7	3	6	3	6	2	4	2	5	1	3
Instructional Equipment with Regular Teacher												
Individual Use	11	23	5	8	10	12	8	13	6	9	4	7
Group Use	4	5	3	3	4	4	3	3	3	3	2	2
Instructional Equipment with Special Teacher												
Individual Use	10	17	3	9	8	14	<.5	4	<.5	2	<.5	2
Group Use	2	3	1	2	2	3	<.5	1	<.5	<.5	<.5	1
Instructional Material Use												
Regular Teacher	24	14	24	11	25	14	22	10	22	12	24	9
Special Teacher	12	14	4	10	11	15	1	4	<.5	3	<.5	3
Total Program Cost	399	180	335	172	360	169	221	125	204	103	203	121

Table B-6

Cost of Reading Programs Offered to Fifth Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 1529 Fifth Graders		Other-CE Students in Title I Schools 559 Fifth Graders		Other-CE Students in Other-CE Schools 565 Fifth Graders		Non-CE Students in Title I Schools 5981 Fifth Graders		Non-CE Students in Other-CE Schools 3147 Fifth Graders		Non-CE Students in Non-CE Schools 1353 Fifth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	24	35	13	25	19	33	26	33	28	39	30	31
14 to 20 students	13	28	8	26	6	19	14	29	11	24	10	23
7 to 13 students	40	58	65	68	55	61	44	64	47	57	29	51
2 to 6 students	74	114	81	125	67	103	48	98	35	77	73	130
Special Teacher												
7 or more students	12	28	13	35	11	31	1	9	<.5	4	<.5	2
2 to 6 students	78	117	50	108	65	116	7	45	2	20	5	26
Teaching Assistant/Aide (Regular Teacher)	14	25	6	12	7	13	2	9	2	10	1	4
Student Tutor/Volunteer Adult	<.5	2	<.5	2	1	3	<.5	1	1	3	<.5	2
Independent Study—Programmed	4	9	3	8	5	12	3	8	5	13	5	13
Independent Study	17	16	22	19	19	12	22	16	22	15	20	18
Clerical Aide Support												
Regular Teacher	2	3	3	4	2	4	1	2	1	2	1	2
Special Teacher	5	11	<.5	4	2	7	<.5	2	<.5	1	<.5	<.5
Teaching Assistant/Aide (Special Teacher)	4	8	1	4	2	6	<.5	2	<.5	1	<.5	<.5
Other Personnel Support	3	6	3	5	3	6	2	4	2	6	1	3
Instructional Equipment with Regular Teacher												
Individual Use	10	18	6	9	9	10	7	13	5	10	8	15
Group Use	3	4	4	5	4	4	2	3	2	3	2	3
Instructional Equipment with Special Teacher												
Individual Use	6	11	3	8	5	11	<.5	3	<.5	1	<.5	1
Group Use	1	2	1	2	1	2	<.5	1	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	24	13	27	20	26	17	22	11	23	15	22	10
Special Teacher	9	13	4	9	8	14	<.5	4	<.5	2	<.5	1
Total Program Cost	344	171	313	151	318	146	201	117	187	85	208	134

Table B-7

Cost of Reading Programs Offered to Sixth Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 1245 Sixth Graders		Other-CE Students in Title I Schools 684 Sixth Graders		Other-CE Students in Other-CE Schools 571 Sixth Graders		Non-CE Students in Title I Schools 6445 Sixth Graders		Non-CE Students in Other-CE Schools 4875 Sixth Graders		Non-CE Students in Non-CE Schools 1740 Sixth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	14	26	16	22	16	23	24	29	27	27	37	36
14 to 20 students	10	23	9	23	11	27	12	25	12	25	12	39
7 to 13 students	47	66	43	68	37	52	32	52	31	53	17	59
2 to 6 students	84	120	66	100	56	100	37	78	45	103	55	150
Special Teacher												
7 or more students	18	37	9	27	12	31	2	11	3	12	7	22
2 to 6 students	87	126	30	84	59	106	6	33	8	26	5	39
Teaching Assistant/Aide (Regular Teacher)	12	24	6	14	8	18	1	6	1	6	<.5	3
Student Tutor/Volunteer Adult	1	2	<.5	1	1	2	<.5	1	<.5	1	<.5	1
Independent Study–Programmed	4	7	4	9	7	13	4	8	4	13	6	12
Independent Study	17	14	17	15	18	12	19	15	20	16	14	14
Clerical Aide Support												
Regular Teacher	2	3	1	3	3	5	1	2	1	2	<.5	1
Special Teacher	7	13	<.5	2	2	8	<.5	2	1	5	1	6
Teaching Assistant/Aide (Special Teacher)	6	9	1	4	2	6	<.5	2	<.5	1	<.5	4
Other Personnel Support	3	6	2	5	3	6	1	3	2	4	1	6
Instructional Equipment with Regular Teacher												
Individual Use	8	11	4	7	11	15	6	10	4	9	5	10
Group Use	3	3	2	3	4	4	2	2	2	3	2	2
Instructional Equipment with Special Teacher												
Individual Use	7	11	2	8	9	17	<.5	3	1	4	<.5	2
Group Use	2	3	1	2	2	3	<.5	1	<.5	1	<.5	1
Instructional Material Use												
Regular Teacher	20	11	17	13	22	15	19	12	19	13	18	10
Special Teacher	10	13	3	8	9	15	<.5	3	1	5	1	6
Total Program Cost	361	158	234	142	292	132	167	100	183	106	180	168

Table B-8

Cost of Mathematics Programs Offered to ALL Grades by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 5296 Students		Other-CE Students in Title I Schools 3674 Students		Other-CE Students in Other-CE Schools 2233 Students		Non-CE Students in Title I Schools 41035 Students		Non-CE Students in Other-CE Schools 19711 Students		Non-CE Students in Non-CE Schools 8062 Students	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	28	30	22	25	23	27	35	30	38	30	39	29
14 to 20 students	11	25	11	25	6	17	9	22	9	22	9	23
7 to 13 students	24	43	25	47	26	43	17	38	16	37	16	39
2 to 6 students	50	85	51	83	50	77	35	74	27	64	42	96
Special Teacher												
7 or more students	12	23	2	11	6	19	1	10	1	6	1	10
2 to 6 students	38	82	17	60	27	68	4	25	2	18	2	15
Teaching Assistant/Aide (Regular Teacher)	13	19	7	13	10	13	2	7	1	5	1	4
Student Tutor/Volunteer Adult	<.5	2	<.5	2	1	2	<.5	1	<.5	1	<.5	1
Independent Study–Programmed	2	6	2	7	5	13	2	7	1	4	1	4
Independent Study	15	12	18	12	20	13	19	14	19	13	19	13
Clerical Aide Support												
Regular Teacher	2	3	2	3	2	4	1	2	1	1	1	2
Special Teacher	5	12	<.5	3	3	10	<.5	3	<.5	2	<.5	1
Teaching Assistant/Aide (Special Teacher)	6	12	1	4	2	7	<.5	3	<.5	1	<.5	<.5
Other Personnel Support	2	4	<.5	2	2	5	<.5	2	<.5	2	<.5	2
Instructional Equipment with Regular Teacher												
Individual Use	5	10	2	4	7	10	3	7	2	5	2	4
Group Use	2	3	1	2	2	3	1	2	1	2	1	2
Instructional Equipment with Special Teacher												
Individual Use	3	9	1	3	3	9	<.5	3	<.5	<.5	<.5	1
Group Use	1	2	<.5	1	1	2	<.5	<.5	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	16	9	16	7	17	10	15	8	15	9	15	7
Special Teacher	5	9	1	5	3	7	<.5	2	<.5	1	<.5	3
Total Program Cost	241	134	180	101	213	97	146	85	132	66	148	103

Table B-9

Cost of Mathematics Programs Offered to First Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 892 First Graders		Other-CE Students in Title I Schools 752 First Graders		Other-CE Students in Other-CE Schools 361 First Graders		Non-CE Students in Title I Schools 7650 First Graders		Non-CE Students in Other-CE Schools 3064 First Graders		Non-CE Students in Non-CE Schools 1319 First Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	27	26	17	17	15	25	32	29	34	30	38	30
14 to 20 students	9	27	13	25	8	20	11	25	9	22	10	20
7 to 13 students	22	34	20	33	27	41	16	35	13	31	11	29
2 to 6 students	43	68	43	68	70	85	30	61	27	56	40	67
Special Teacher												
7 or more students	12	24	1	5	2	8	1	4	<.5	2	<.5	1
2 to 6 students	16	41	8	36	14	44	1	13	1	8	2	11
Teaching Assistant/Aide (Regular Teacher)	16	21	9	13	11	12	3	9	1	3	2	8
Student Tutor/Volunteer Adult	1	2	1	2	<.5	1	<.5	1	<.5	1	<.5	1
Independent Study—Programmed	1	4	1	2	<.5	2	1	4	<.5	1	<.5	1
Independent Study	14	10	14	8	25	14	21	14	21	13	21	15
Clerical Aide Support												
Regular Teacher	2	3	2	3	<.5	1	1	2	1	1	1	2
Special Teacher	5	13	<.5	1	2	7	<.5	2	<.5	1	<.5	<.5
Teaching Assistant/Aide (Special Teacher)	6	12	1	4	<.5	2	<.5	2	<.5	<.5	<.5	<.5
Other Personnel Support	1	3	<.5	<.5	1	3	<.5	2	<.5	1	<.5	<.5
Instructional Equipment with Regular Teacher												
Individual Use	4	8	1	3	7	10	2	6	1	3	1	2
Group Use	1	2	1	1	2	3	1	2	1	1	1	1
Instructional Equipment with Special Teacher												
Individual Use	3	9	<.5	<.5	2	5	<.5	4	<.5	<.5	<.5	<.5
Group Use	1	1	<.5	<.5	1	2	<.5	<.5	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	17	8	19	7	20	10	17	7	19	7	18	6
Special Teacher	5	8	1	3	3	6	<.5	2	<.5	1	<.5	<.5
Total Program Cost	206	98	150	80	210	95	138	74	128	61	144	82

Table B-10

Cost of Mathematics Programs Offered to Second Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 895 Second Graders		Other-CE Students in Title I Schools 615 Second Graders		Other-CE Students in Other-CE Schools 303 Second Graders		Non-CE Students in Title I Schools 6738 Second Graders		Non-CE Students in Other-CE Schools 2807 Second Graders		Non-CE Students in Non-CE Schools 1169 Second Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	28	28	18	19	17	26	34	28	32	28	37	26
14 to 20 students	13	25	10	26	4	11	8	19	10	21	10	22
7 to 13 students	15	30	24	37	42	53	15	42	12	26	17	34
2 to 6 students	32	66	36	67	54	85	38	74	32	63	29	64
Special Teacher												
7 or more students	10	21	1	6	3	9	1	6	<.5	2	<.5	1
2 to 6 students	33	88	9	54	19	52	2	17	1	11	1	7
Teaching Assistant/Aide (Regular Teacher)	13	17	13	18	12	12	2	8	1	6	1	3
Student Tutor/Volunteer Adult	<.5	1	<.5	1	1	2	<.5	1	<.5	1	<.5	1
Independent Study—Programmed	2	5	1	7	2	5	1	5	2	6	<.5	2
Independent Study	17	9	20	10	20	14	22	13	21	12	21	11
Clerical Aide Support												
Regular Teacher	2	3	2	3	1	2	1	2	1	1	1	2
Special Teacher	6	13	<.5	1	<.5	1	<.5	2	<.5	<.5	<.5	<.5
Teaching Assistant/Aide (Special Teacher)	6	12	<.5	3	1	3	<.5	3	<.5	<.5	<.5	<.5
Other Personnel Support	1	2	<.5	2	3	5	<.5	2	<.5	2	<.5	<.5
Instructional Equipment with Regular Teacher												
Individual Use	5	8	2	4	8	13	3	6	2	5	1	3
Group Use	2	2	1	1	2	4	1	2	1	1	1	2
Instructional Equipment with Special Teacher												
Individual Use	4	10	<.5	1	2	6	<.5	4	<.5	<.5	<.5	<.5
Group Use	1	1	<.5	<.5	1	2	<.5	<.5	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	19	10	16	7	18	10	17	7	18	9	17	8
Special Teacher	5	9	1	3	3	7	<.5	3	<.5	1	<.5	<.5
Total Program Cost	214	140	155	84	212	70	146	84	132	61	135	74

Table B-11

Cost of Mathematics Programs Offered to Third Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 1012 Third Graders		Other-CE Students in Title I Schools 539 Third Graders		Other-CE Students in Other-CE Schools 378 Third Graders		Non-CE Students in Title I Schools 6460 Third Graders		Non-CE Students in Other-CE Schools 2770 Third Graders		Non-CE Students in Non-CE Schools 1240 Third Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	28	30	28	31	31	33	36	28	35	29	31	21
14 to 20 students	8	16	12	25	7	15	8	18	10	24	14	30
7 to 13 students	29	45	16	31	27	44	15	34	18	41	13	35
2 to 6 students	45	70	46	65	46	78	31	62	27	75	40	88
Special Teacher												
7 or more students	13	23	1	6	3	13	1	6	<.5	4	<.5	1
2 to 6 students	37	66	19	63	31	74	4	27	2	21	1	13
Teaching Assistant/Aide (Regular Teacher)	15	19	9	14	11	16	2	8	<.5	1	<.5	3
Student Tutor/Volunteer Adult	1	2	<.5	1	<.5	1	<.5	1	<.5	1	<.5	1
Independent Study—Programmed	2	5	1	2	4	13	1	5	<.5	2	1	5
Independent Study	15	11	21	12	22	14	22	13	21	14	23	12
Clerical Aide Support												
Regular Teacher	2	3	2	3	3	4	1	2	1	2	1	2
Special Teacher	5	11	<.5	3	5	12	<.5	2	<.5	1	<.5	1
Teaching Assistant/Aide (Special Teacher)	6	11	<.5	3	4	9	<.5	3	<.5	<.5	<.5	<.5
Other Personnel Support	1	3	1	4	1	3	<.5	1	<.5	2	<.5	1
Instructional Equipment with Regular Teacher												
Individual Use	5	8	3	5	2	3	4	7	2	4	3	5
Group Use	2	3	1	2	1	2	1	2	1	1	1	2
Instructional Equipment with Special Teacher												
Individual Use	3	8	1	3	1	2	<.5	2	<.5	1	<.5	<.5
Group Use	1	1	<.5	1	1	1	<.5	<.5	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	16	9	16	6	17	11	15	8	16	13	17	8
Special Teacher	6	9	1	5	2	6	<.5	2	<.5	1	<.5	<.5
Total Program Cost	240	115	179	93	218	112	143	80	135	75	147	98

Table B-12

Cost of Mathematics Programs Offered to Fourth Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 936 Fourth Graders		Other-CE Students in Title I Schools 622 Fourth Graders		Other-CE Students in Other-CE Schools 357 Fourth Graders		Non-CE Students in Title I Schools 6437 Fourth Graders		Non-CE Students in Other-CE Schools 2904 Fourth Graders		Non-CE Students in Non-CE Schools 1241 Fourth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	31	32	26	28	30	25	35	28	39	30	41	27
14 to 20 students	13	27	12	30	4	11	10	22	10	21	14	26
7 to 13 students	20	37	37	71	15	31	16	37	14	31	16	36
2 to 6 students	59	103	53	113	46	71	35	72	25	61	35	91
Special Teacher												
7 or more students	9	18	2	9	6	16	2	14	<.5	3	<.5	2
2 to 6 students	41	75	31	77	40	94	6	35	4	31	2	17
Teaching Assistant/Aide (Regular Teacher)	10	15	2	9	10	16	2	6	1	5	<.5	2
Student Tutor/Volunteer Adult	<.5	2	<.5	1	<.5	1	<.5	1	<.5	2	<.5	1
Independent Study—Programmed	4	9	1	3	8	21	2	7	1	2	1	3
Independent Study	17	13	23	15	20	15	19	14	19	14	20	14
Clerical Aide Support												
Regular Teacher	2	4	2	3	3	5	1	2	1	1	1	2
Special Teacher	7	13	<.5	3	6	12	1	4	<.5	1	<.5	1
Teaching Assistant/Aide (Special Teacher)	7	12	<.5	3	4	9	<.5	3	<.5	1	<.5	1
Other Personnel Support	3	6	<.5	2	3	8	1	3	<.5	3	<.5	1
Instructional Equipment with Regular Teacher												
Individual Use	7	14	3	5	6	8	4	8	2	5	1	3
Group Use	2	3	1	1	3	3	2	2	1	2	1	1
Instructional Equipment with Special Teacher												
Individual Use	5	11	1	4	5	14	<.5	3	<.5	1	<.5	1
Group Use	1	2	<.5	1	1	2	<.5	1	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	15	10	15	8	15	9	14	8	13	8	13	7
Special Teacher	6	10	1	6	5	9	1	3	<.5	1	<.5	1
Total Program Cost	258	147	213	136	233	119	151	85	132	70	147	94

Table B-13

Cost of Mathematics Programs Offered to Fifth Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 863 Fifth Graders		Other-CE Students in Title I Schools 481 Fifth Graders		Other-CE Students in Other-CE Schools 407 Fifth Graders		Non-CE Students in Title I Schools 6780 Fifth Graders		Non-CE Students in Other-CE Schools 3326 Fifth Graders		Non-CE Students in Non-CE Schools 1353 Fifth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	31	34	24	30	21	24	39	35	37	28	38	32
14 to 20 students	10	23	10	23	5	16	10	24	6	16	8	19
7 to 13 students	31	55	28	55	28	42	22	43	15	31	17	39
2 to 6 students	52	88	67	94	51	75	35	88	33	68	59	116
Special Teacher												
7 or more students	14	26	3	11	8	23	2	16	1	8	<.5	2
2 to 6 students	58	113	25	76	26	61	5	33	2	15	3	17
Teaching Assistant/Aide (Regular Teacher)	13	23	3	8	8	12	1	7	1	7	1	3
Student Tutor/Volunteer Adult	1	2	<.5	1	1	2	<.5	1	<.5	1	<.5	1
Independent Study—Programmed	3	8	3	9	5	11	2	7	1	4	2	5
Independent Study	14	13	18	14	18	10	17	14	19	14	18	14
Clerical Aide Support												
Regular Teacher	2	3	2	2	2	3	1	2	1	2	<.5	1
Special Teacher	4	11	<.5	1	3	9	<.5	3	<.5	1	<.5	2
Teaching Assistant/Aide (Special Teacher)	6	11	<.5	2	3	8	1	4	<.5	<.5	<.5	1
Other Personnel Suppor.	2	5	<.5	1	1	4	<.5	2	<.5	2	<.5	1
Instructional Equipment with Regular Teacher												
Individual Use	6	11	2	3	9	12	3	7	3	8	4	7
Group Use	2	3	1	2	3	3	1	2	1	2	2	2
Instructional Equipment with Special Teacher												
Individual Use	3	8	2	6	2	9	<.5	3	<.5	<.5	<.5	1
Group Use	1	2	<.5	1	<.5	1	<.5	1	<.5	<.5	<.5	<.5
Instructional Material Use												
Regular Teacher	16	10	13	7	17	9	13	8	14	8	13	7
Special Teacher	5	9	3	7	2	6	<.5	2	<.5	1	<.5	1
Total Program Cost	273	149	205	97	213	90	153	100	135	64	166	116

Table B-14

Cost of Mathematics Programs Offered to Sixth Graders by Resource Cost Variables and by CE Student Selection Categories (In Standard Resource Dollars)

	Title I Students in Title I Schools 698 Sixth Graders		Other-CE Students in Title I Schools 665 Sixth Graders		Other-CE Students in Other-CE Schools 427 Sixth Graders		Non-CE Students in Title I Schools 6970 Sixth Graders		Non-CE Students in Other-CE Schools 4840 Sixth Graders		Non-CE Students in Non-CE Schools 1740 Sixth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Regular Teacher												
Whole Class, 21 or more	18	26	20	25	22	24	35	31	44	33	44	32
14 to 20 students	16	30	10	20	8	24	9	21	10	25	4	18
7 to 13 students	27	50	24	42	19	42	16	36	19	49	19	52
2 to 6 students	73	108	66	81	36	64	40	84	21	59	44	117
Special Teacher												
7 or more students	13	26	4	20	11	29	1	9	2	9	4	21
2 to 6 students	46	93	15	52	28	69	4	21	2	14	2	18
Teaching Assistant/Aide (Regular Teacher)	12	16	3	9	8	11	1	5	<.5	4	<.5	1
Student Tutor/Volunteer Adult	1	2	<.5	2	1	2	<.5	1	<.5	1	<.5	1
Independent Study–Programmed	2	5	5	11	7	12	4	12	1	4	2	5
Independent Study	14	13	15	11	15	11	16	14	13	13	13	11
Clerical Aide Support												
Regular Teacher	2	3	1	2	4	5	1	2	1	1	<.5	1
Special Teacher	4	11	1	4	3	9	<.5	2	1	3	<.5	<.5
Teaching Assistant/Aide (Special Teacher)	6	11	1	5	2	7	<.5	2	<.5	1	<.5	<.5
Other Personnel Support	2	5	<.5	2	1	2	1	3	<.5	2	1	5
Instructional Equipment with Regular Teacher												
Individual Use	4	5	3	5	8	12	3	6	2	4	1	4
Group Use	2	3	2	2	3	4	2	2	1	2	1	1
Instructional Equipment with Special Teacher												
Individual Use	2	4	1	3	3	11	<.5	1	<.5	<.5	<.5	1
Group Use	1	1	<.5	1	1	2	<.5	<.5	<.5	<.5	<.5	1
Instructional Material Use												
Regular Teacher	14	9	15	7	14	11	11	7	12	7	14	7
Special Teacher	5	9	2	6	3	8	<.5	2	<.5	2	1	5
Total Program Cost	260	140	187	90	195	83	144	87	131	65	150	126

APPENDIX C
TABLES SUPPORTING CHAPTER 3

The tables in this appendix provide the grade-by-grade data for the material presented in Chapter 3.

Table C-1

Cost of Reading Programs Offered to First Graders by Student CE Selection Categories (In Standard Resource Dollars)

	Reading CE Selection Category											
	Title I Students in Title I Schools 1698 First Graders		Other-CE Students in Title I Schools 841 First Graders		Other-CE Students in Other-CE Schools 554 First Graders		Non-CE Students in Title I Schools 6727 First Graders		Non-CE Students in Other-CE Schools 2862 First Graders		Non-CE Students in Non-CE Schools 1319 First Graders	
Reading Program Cost	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	388	208	357	184	398	201	307	151	311	153	294	147
Instructional Support	14	20	7	10	8	13	3	7	3	6	2	4
Equipment and Materials	57	35	41	25	63	36	39	20	41	21	36	16
Reading Total Program Cost	459	226	405	197	469	209	349	155	355	156	332	147
25th Percentile	287		276		308		241		250		236	
50th Percentile	410		375		416		312		307		297	
75th Percentile	594		483		564		427		414		391	

Table C-2

Cost of Reading Programs Offered to Second Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Cost	Reading CE Selection Category											
	Title I Students in Title I Schools 1831 Second Graders		Other-CE Students in Title I Schools 846 Second Graders		Other-CE Students in Other-CE Schools 607 Second Graders		Non-CE Students in Title I Schools 5547 Second Graders		Non-CE Students in Other-CE Schools 2487 Second Graders		Non-CE Students in Non-CE Schools 1169 Second Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	387	217	350	189	379	179	294	176	280	145	256	125
Instructional Support	19	23	8	11	8	12	4	7	1	7	3	5
Equipment and Materials	63	38	44	21	64	38	38	21	39	27	37	17
Reading Total Program Cost	469	234	402	196	451	182	336	181	324	153	296	132
25th Percentile	307		267		324		215		224		182	
50th Percentile	428		354		404		285		289		274	
75th Percentile	564		470		517		406		370		384	

Table C-3

Cost of Reading Programs Offered to Third Graders by Student CE Selection Categories (In Standard Resource Dollars)

	Reading CE Selection Categories											
	Title I Students in Title I Schools 1880 Third Graders		Other-CE Students in Title I Schools 729 Third Graders		Other-CE Students in Other-CE Schools 556 Third Graders		Non-CE Students in Title I Schools 5359 Third Graders		Non-CE Students in Other-CE Schools 2557 Third Graders		Non-CE Students in Non-CE Schools 1248 Third Graders	
Reading Program Cost	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	330	169	325	153	348	193	231	128	218	128	235	146
Instructional Support	17	21	7	10	10	14	4	9	3	4	2	4
Equipment and Materials	64	38	42	22	53	29	36	20	35	21	34	17
Reading Total Program Cost	411	182	374	163	411	204	272	134	256	135	271	151
25th Percentile	276		252		258		176		163		158	
50th Percentile	376		357		387		240		214		215	
75th Percentile	525		455		523		338		307		361	

Table C-4

Cost of Reading Programs Offered to Fourth Graders by Student CE Selection Categories (In Standard Resource Dollars)

	Reading CE Selection Categories											
	Title I Students in Title I Schools 1602 Fourth Graders		Other-CE Students in Title I Schools 690 Fourth Graders		Other-CE Students in Other-CE Schools 534 Fourth Graders		Non-CE Students in Title I Schools 5721 Fourth Graders		Non-CE Students in Other-CE Schools 2726 Fourth Graders		Non-CE Students in Non-CE Schools 1217 Fourth Graders	
Reading Program Cost	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	316	161	288	163	288	156	183	114	171	96	171	117
Instructional Support	19	25	7	11	12	17	3	8	3	6	1	4
Equipment and Materials	64	48	40	25	60	38	34	24	30	20	30	15
Reading Total Program Cost	399	180	335	172	360	169	221	125	204	103	203	121
25th Percentile	261		219		243		136		137		134	
50th Percentile	377		282		329		187		176		167	
75th Percentile	510		435		438		259		246		217	

Table C-5

Cost of Reading Programs Offered to Fifth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Cost	Reading CE Selection Categories: Title I Students in Title I Schools 1529 Fifth Graders		Other-CE Students in Title I Schools 559 Fifth Graders		Other-CE Students in Other-CE Schools 565 Fifth Graders		Non-CE Students in Title I Schools 5981 Fifth Graders		Non-CE Students in Other-CE Schools 3147 Fifth Graders		Non-CE Students in Non-CE Schools 1353 Fifth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	277	157	262	140	256	130	166	108	152	78	175	130
Instructional Support	13	19	7	9	10	16	3	6	3	6	2	3
Equipment and Materials	53	38	44	32	52	31	32	24	31	21	32	23
Reading Total Program Cost	344	171	313	151	318	146	201	117	187	85	208	134
25th Percentile	224		178		216		126		125		113	
50th Percentile	323		293		283		169		167		158	
75th Percentile	439		426		391		236		222		252	

Table C-6

Cost of Reading Programs Offered to Sixth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Cost	Reading CE Selection Categories											
	Title I Students in Title I Schools 1245 Sixth Graders		Other-CE Students in Title I Schools 684 Sixth Graders		Other-CE Students in Other-CE Schools 571 Sixth Graders		Non-CE Students in Title I Schools 6445 Sixth Graders		Non-CE Students in Other-CE Schools 4875 Sixth Graders		Non-CE Students in Non-CE Schools 1740 Sixth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	293	147	201	133	224	120	136	90	151	98	152	160
Instructional Support	18	24	4	7	11	15	2	6	4	8	3	13
Equipment and Materials	50	28	29	23	57	40	28	20	28	20	25	20
Reading Total Program Cost	361	158	234	142	292	132	167	100	183	106	180	168
25th Percentile	242		132		206		99		103		89	
50th Percentile	347		184		261		144		151		113	
75th Percentile	462		324		376		207		229		206	

Table C-7

Cost of Mathematics Programs Offered to First Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Cost	Mathematics CE Selection Category: Title I Students in Title I Schools 892 First Graders		Other-CE Students in Title I Schools 752 First Graders		Other-CE Students in Other-CE Schools 361 First Graders		Non-CE Students in Title I Schools 7650 First Graders		Non-CE Students in Other-CE Schools 3064 First Graders		Non-CE Students in Non-CE Schools 1319 First Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	162	84	126	76	173	78	116	71	107	59	123	81
Instructional Support	14	23	2	5	4	10	2	5	1	2	1	2
Equipment and Materials	31	22	22	9	34	27	21	12	21	9	20	7
Mathematics Total Program Cost	206	98	150	80	210	95	138	74	128	61	144	82
25th Percentile	130		87		144		90		87		91	
50th Percentile	187		138		194		116		116		115	
75th Percentile	254		202		250		162		155		164	

Table C-8

Cost of Mathematics Programs Offered to Second Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Cost	Mathematics CE Selection Category: Title I Students in Title I Schools 895 Second Graders		Other-CE Students in Title I Schools 615 Second Graders		Other-CE Students in Other-CE Schools 303 Second Graders		Non-CE Students in Title I Schools 6738 Second Graders		Non-CE Students in Other-CE Schools 2807 Second Graders		Non-CE Students in Non-CE Schools 1169 Second Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	164	117	133	80	174	72	123	82	110	60	115	72
Instructional Support	14	24	2	5	3	7	2	6	1	3	1	2
Equipment and Materials	35	22	19	10	34	29	21	13	21	12	19	11
Mathematics Total Program Cost	214	140	155	84	212	70	146	84	132	61	135	74
25th Percentile	126		93		157		92		93		83	
50th Percentile	162		142		209		121		114		117	
75th Percentile	271		197		250		175		152		157	

Table C-9

Cost of Mathematics Programs Offered to Third Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Cost	Mathematics CE Selection Category											
	Title I Students in Title I Schools 1012 Third Graders		Other-CE Students in Title I Schools 539 Third Graders		Other-CE Students in Other-CE Schools 378 Third Graders		Non-CE Students in Title I Schools 6460 Third Graders		Non-CE Students in Other-CE Schools 2770 Third Graders		Non-CE Students in Non-CE Schools 1240 Third Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	194	102	153	83	182	98	120	74	115	74	124	98
Instructional Support	14	22	4	8	13	20	2	5	1	3	1	2
Equipment and Materials	32	20	22	15	23	14	21	14	19	14	21	12
Mathematics Total Program Cost	240	115	179	93	218	112	143	80	135	75	147	98
25th Percentile	162		117		136		94		85		91	
50th Percentile	218		147		186		120		119		110	
75th Percentile	281		212		251		170		156		184	

Table C-10

Cost of Mathematics Programs Offered to Fourth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Cost	Mathematics CE Selection Category											
	Title I Students in Title I Schools 936 Fourth Graders		Other-CE Students in Title I Schools 622 Fourth Graders		Other-CE Students in Other-CE Schools 357 Fourth Graders		Non-CE Students in Title I Schools 6437 Fourth Graders		Non-CE Students in Other-CE Schools 2904 Fourth Graders		Non-CE Students in Non-CE Schools 1241 Fourth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	203	126	188	129	181	112	128	79	114	66	130	93
Instructional Support	19	26	3	7	17	20	3	7	1	4	1	2
Equipment and Materials	36	30	22	16	35	26	21	16	17	12	16	8
Mathematics Total Program Cost	258	147	213	136	233	119	151	85	132	70	147	94
25th Percentile	142		113		151		94		92		96	
50th Percentile	220		182		198		125		108		118	
75th Percentile	359		281		286		183		151		156	

Table C-11

Cost of Mathematics Programs Offered to Fifth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Cost	Mathematics CE Selection Category											
	Title I Students in Title I Schools 863 Fifth Graders		Other-CE Students in Title I Schools 481 Fifth Graders		Other-CE Students in Other-CE Schools 407 Fifth Graders		Non-CE Students in Title I Schools 6780 Fifth Graders		Non-CE Students in Other-CE Schools 3326 Fifth Graders		Non-CE Students in Non-CE Schools 1353 Fifth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	226	133	182	96	170	77	133	94	116	63	147	113
Instructional Support	14	22	2	4	9	18	2	8	1	2	1	3
Equipment and Materials	32	25	21	16	34	24	18	15	18	12	19	14
Mathematics Total Program Cost	273	149	205	97	213	90	153	100	135	64	166	116
25th Percentile	153		143		147		96		94		92	
50th Percentile	257		192		198		116		114		123	
75th Percentile	358		249		252		175		154		182	

Table C-12

Cost of Mathematics Programs Offered to Sixth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Cost	Mathematics CE Selection Category											
	Title I Students in Title I Schools 698 Sixth Graders		Other-CE Students in Title I Schools 665 Sixth Graders		Other-CE Students in Other-CE Schools 427 Sixth Graders		Non-CE Students in Title I Schools 6970 Sixth Graders		Non-CE Students in Other-CE Schools 4840 Sixth Graders		Non-CE Students in Non-CE Schools 1740 Sixth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Teaching Personnel	220	128	162	85	154	76	126	85	114	65	131	124
Instructional Support	14	21	3	9	9	16	2	5	2	4	1	5
Equipment and Materials	27	15	22	12	31	28	17	12	16	10	17	10
Mathematics Total Program Cost	260	140	187	90	195	83	144	87	131	65	150	126
25th Percentile	149		124		136		90		89		91	
50th Percentile	226		188		178		112		112		107	
75th Percentile	362		205		234		165		150		156	

Table C-13

Cost of Reading Program Components Offered to First Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Components	Reading CE Selection Category: Title I Students in Title I Schools 1698 First Graders		Other-CE Students in Title I Schools 841 First Graders		Other-CE Students in Other-CE Schools 554 First Graders		Non-CE Students in Title I Schools 6727 First Graders		Non-CE Students in Other-CE Schools 2862 First Graders		Non-CE Students in Non-CE Schools 1319 First Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	31	43	26	34	18	29	32	42	32	38	47	69
Large Group	12	34	14	43	9	28	16	42	20	58	12	30
Medium Group	79	81	101	86	82	100	120	102	119	115	106	91
Small Group	152	174	161	192	219	217	122	175	129	194	119	171
Teaching Assistant/Aide												
Small Group	27	38	27	34	18	27	11	27	5	18	6	14
Special Teacher												
Medium Group	25	56	8	29	12	31	1	10	1	8	<.5	6
Small Group	102	152	35	90	72	130	7	40	3	19	3	19
Tutoring by Student/ Volunteer Adult	1	3	2	4	1	2	1	3	1	5	2	5
Independent Study – Programmed	4	12	2	6	5	12	4	11	5	15	1	6
Independent Study	26	19	29	23	33	20	35	24	39	24	36	23
Reading Total Program Cost	459	226	405	197	469	209	349	155	355	156	332	147

Table C-14

Cost of Reading Program Components Offered to Second Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Components	Reading CE Selection Category											
	Title I Students in Title I Schools 1831 Second Graders		Other-CE Students in Title I Schools 846 Second Graders		Other-CE Students in Other-CE Schools 607 Second Graders		Non-CE Students in Title I Schools 5547 Second Graders		Non-CE Students in Other-CE Schools 2487 Second Graders		Non-CE Students in Non-CE Schools 1169 Second Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	22	37	23	38	18	28	32	49	27	40	25	38
Large Group	10	31	8	30	15	40	14	40	27	61	24	47
Medium Group	92	92	114	95	92	107	108	109	115	114	110	108
Small Group	144	199	138	201	157	179	126	198	97	188	87	134
Teaching Assistant/Aide												
Small Group	23	34	21	30	13	23	6	18	6	22	3	10
Special Teacher												
Medium Group	35	63	7	25	12	30	2	15	1	7	1	7
Small Group	117	157	57	127	108	148	8	47	5	33	8	38
Tutoring by Student/ Volunteer Adult	1	3	1	3	1	4	1	3	1	3	1	4
Independent Study – Programmed	4	11	2	9	4	10	5	14	5	14	2	7
Independent Study	23	18	32	22	30	22	33	23	40	25	35	19
Reading Total Program Cost	469	234	402	196	451	182	336	181	324	153	296	132

Table C-15

Cost of Reading Program Components Offered to Third Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Components	Reading CE Selection Category											
	Title I Students in Title I Schools 1880 Third Graders		Other-CE Students in Title I Schools 729 Third Graders		Other-CE Students in Other-CE Schools 556 Third Graders		Non-CE Students in Title I Schools 5359 Third Graders		Non-CE Students in Other-CE Schools 2557 Third Graders		Non-CE Students in Non-CE Schools 1248 Third Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	27	43	15	25	27	42	29	44	30	44	33	37
Large Group	11	31	8	26	15	38	17	37	33	86	19	42
Medium Group	73	81	95	94	69	93	82	86	88	107	67	85
Small Group	118	153	130	146	138	171	92	143	66	135	109	156
Teaching Assistant/Aide												
Small Group	25	36	20	30	17	29	6	17	1	6	5	14
Special Teacher												
Medium Group	32	58	7	23	18	47	2	11	1	5	1	6
Small Group	100	129	63	136	98	153	9	49	4	30	6	31
Tutoring by Student/ Volunteer Adult	1	3	<5	2	<5	1	<5	2	<5	4	<5	2
Independent Study – Programmed	3	8	4	9	3	13	3	9	4	11	1	3
Independent Study	21	16	32	22	25	15	31	21	29	21	30	17
Reading Total Program Cost	411	182	374	163	411	204	272	134	256	135	271	151

Table C-16

Cost of Reading Program Components Offered to Fourth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Components	Reading CE Selection Category: Title I Students in Title I Schools 1602 Fourth Graders		Other-CE Students in Title I Schools 690 Fourth Graders		Other-CE Students in Other-CE Schools 534 Fourth Graders		Non-CE Students in Title I Schools 5722 Fourth Graders		Non-CE Students in Other-CE Schools 2726 Fourth Graders		Non-CE Students in Non-CE Schools 1217 Fourth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	29	46	20	35	28	41	31	43	33	46	49	43
Large Group	17	40	6	23	16	38	19	37	27	56	24	43
Medium Group	68	83	87	91	65	79	64	81	65	79	43	62
Small Group	102	148	114	161	85	126	65	125	42	91	53	127
Teaching Assistant/Aide												
Small Group	19	30	11	23	14	27	4	13	2	11	<5	3
Special Teacher												
Medium Group	30	60	9	29	24	51	2	14	1	9	<5	3
Small Group	110	131	59	119	98	153	8	43	4	26	7	44
Tutoring by Student/ Volunteer Adult	<5	2	<5	1	1	3	<5	2	<5	1	<5	1
Independent Study – Programmed	4	9	2	6	7	16	3	8	5	13	2	6
Independent Study	20	17	26	22	23	17	23	16	24	17	23	14
Reading Total Program Cost	399	180	335	172	360	169	221	125	204	103	203	121

Table C-17

Cost of Reading Program Components Offered to Fifth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Components	Reading CE Selection Category: Title I Students in Title I Schools 1529 Fifth Graders		Other-CE Students in Title I Schools 559 Fifth Graders		Other-CE Students in Other-CE Schools 565 Fifth Graders		Non-CE Students in Title I Schools 5981 Fifth Graders		Non-CE Students in Other-CE Schools 3147 Fifth Graders		Non-CE Students in Non-CE Schools 1353 Fifth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	37	52	18	32	28	46	38	46	40	50	44	41
Large Group	17	36	11	32	8	26	18	37	15	34	14	31
Medium Group	49	68	83	84	74	85	55	75	60	75	35	61
Small Group	84	127	92	141	75	114	53	108	38	84	84	142
Teaching Asssitant/Aide												
Small Group	21	36	10	21	12	20	3	15	2	12	1	5
Special Teacher												
Medium Group	21	46	17	44	17	50	1	11	1	8	<.5	2
Small Group	94	133	56	118	78	135	8	50	2	21	5	27
Tutoring by Student/ Volunteer Adult	<.5	2	<.5	2	1	3	<.5	1	1	3	<.5	2
Independent Study – Programmed	4	9	3	8	5	12	3	8	5	13	5	13
Independent Study	17	16	22	19	19	12	22	16	22	15	20	18
Reading Total Program Cost	344	171	313	151	318	146	201	117	187	85	208	134

Table C-18

Cost of Reading Program Components Offered to Sixth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Reading Program Components	Reading CE Selection Category											
	Title I Students in Title I Schools 1245 Sixth Graders		Other-CE Students in Title I Schools 684 Sixth Graders		Other-CE Students in Other-CE Schools 571 Sixth Graders		Non-CE Students in Title I Schools 6445 Sixth Graders		Non-CE Students in Other-CE Schools 4875 Sixth Graders		Non-CE Students in Non-CE Schools 1740 Sixth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	21	39	22	29	29	41	35	40	39	38	49	42
Large Group	14	31	12	30	15	38	16	33	15	32	15	45
Medium Group	58	79	53	80	51	72	41	62	38	66	20	65
Small Group	92	131	72	107	62	110	42	86	50	114	62	161
Teaching Assistant/Aide												
Small Group	17	32	9	20	13	25	2	9	1	7	<5	3
Special Teacher												
Medium Group	33	59	13	36	21	51	2	16	6	20	9	35
Small Group	104	143	33	92	75	128	7	36	9	30	5	43
Tutoring by Student/ Volunteer Adult	1	2	<5	1	1	2	<5	1	<5	1	<5	1
Independent Study – Programmed	4	7	4	9	7	13	4	8	4	13	6	12
Independent Study	17	14	17	15	18	12	19	15	20	16	14	14
Reading Total Program Cost	361	158	234	142	292	132	167	100	183	106	180	168

Table C-19

Cost of Mathematics Program Components Offered to First Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Components	Mathematics CE Selection Category: Title I Students in Title I Schools 892 First Graders		Other-CE Students in Title I Schools 752 First Graders		Other-CE Students in Other-CE Schools 361 First Graders		Non-CE Students in Title I Schools 7650 First Graders		Non-CE Students in Other-CE Schools 3064 First Graders		Non-CE Students in Non-CE Schools 1319 First Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	38	33	25	25	21	32	44	36	48	36	51	36
Large Group	12	31	17	32	11	27	14	31	12	28	12	24
Medium Group	27	41	24	38	34	50	19	40	16	38	12	32
Small Group	46	73	46	72	79	97	32	65	29	60	42	71
Teaching Assistant/Aide												
Small Group	20	26	11	16	16	16	3	11	1	4	3	10
Special Teacher												
Medium Group	25	49	1	6	4	15	1	11	<.5	2	<.5	1
Small Group	22	51	10	40	19	54	2	14	1	9	2	11
Tutoring by Student/ Volunteer Adult	1	2	1	2	<.5	1	<.5	1	<.5	1	<.5	1
Independent Study – Programmed	1	4	1	2	<.5	2	1	4	<.5	1	<.5	1
Independent Study	14	10	14	8	25	14	21	14	21	13	21	15
Mathematics Total Program Cost	206	98	150	80	210	95	138	74	128	61	144	82

Table C-20

Cost of Mathematics Program Components Offered to Second Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Components	Mathematics CE Selection Category: Title I Students in Title I Schools 895 Second Graders		Other-CE Students in Title I Schools 615 Second Graders		Other-CE Students in Other-CE Schools 303 Second Graders		Non-CE Students in Title I Schools 6738 Second Graders		Non-CE Students in Other-CE Schools 2807 Second Graders		Non-CE Students in Non-CE Schools 1169 Second Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	43	39	27	28	25	34	47	37	46	37	49	33
Large Group	17	30	12	30	6	16	11	24	13	28	13	29
Medium Group	18	36	27	42	56	72	18	47	14	30	19	39
Small Group	34	70	39	72	57	87	41	79	34	66	31	67
Teaching Assistant/Aide												
Small Group	17	23	16	21	17	15	3	10	2	7	1	4
Special Teacher												
Medium Group	20	39	1	7	7	17	2	13	<.5	2	<.5	1
Small Group	45	113	10	58	21	56	2	19	1	12	1	8
Tutoring by Student/ Volunteer Adult	<.5	1	<.5	1	1	2	<.5	1	<.5	1	<.5	1
Independent Study – Programmed	2	5	1	7	2	5	1	5	2	6	<.5	2
Independent Study	17	9	20	10	20	14	22	13	21	12	21	11
Mathematics Total Program Cost	214	140	155	84	212	70	146	84	132	61	135	74

Table C-21

Cost of Mathematics Program Components Offered to Third Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Components	Mathematics CE Selection Category: Title I Students in Title I Schools 1012 Third Graders Mean	S.D.	Other-CE Students in Title I Schools 539 Third Graders Mean	S.D.	Other-CE Students in Other-CE Schools 378 Third Graders Mean	S.D.	Non-CE Students in Title I Schools 6460 Third Graders Mean	S.D.	Non-CE Students in Other-CE Schools 2770 Third Graders Mean	S.D.	Non-CE Students in Non-CE Schools 1240 Third Graders Mean	S.D.
Classroom Teacher												
Whole Class	37	36	38	39	42	42	49	36	49	40	45	31
Large Group	11	23	15	30	8	19	10	24	13	29	18	38
Medium Group	35	52	19	35	32	52	18	40	20	45	15	39
Small Group	48	75	50	71	49	82	33	67	29	78	42	90
Teaching Assistant/Aide												
Small Group	20	23	12	19	14	21	3	11	<.5	1	1	4
Special Teacher												
Medium Group	25	47	2	8	10	27	1	9	<.5	5	<.5	1
Small Group	47	80	22	71	36	84	5	30	2	21	1	13
Tutoring by Student/ Volunteer Adult	1	2	<.5	1	<.5	1	<.5	1	<.5	1	<.5	1
Independent Study – Programmed	2	5	1	2	4	13	1	5	<.5	2	1	5
Independent Study	15	11	21	12	22	14	22	13	21	14	23	12
Mathematics Total Program Cost	240	115	179	93	218	112	143	80	135	75	147	98

Table C-22

Cost of Mathematics Program Components Offered to Fourth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Components	Mathematics CE Selection Category: Title I Students in Title I Schools 936 Fourth Graders		Other-CE Students in Title I Schools 622 Fourth Graders		Other-CE Students in Other-CE Schools 357 Fourth Graders		Non-CE Students in Title I Schools 6437 Fourth Graders		Non-CE Students in Other-CE Schools 2904 Fourth Graders		Non-CE Students in Non-CE Schools 1241 Fourth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	42	42	37	38	48	43	47	37	50	36	51	32
Large Group	15	32	15	35	6	15	13	27	13	25	17	30
Medium Group	23	43	41	77	18	37	19	42	17	36	18	40
Small Group	65	114	57	119	51	80	37	77	27	65	37	94
Teaching Assistant/Aide												
Small Group	15	23	3	11	14	23	2	9	1	6	<.5	2
Special Teacher												
Medium Group	21	42	2	10	18	47	3	19	<.5	5	<.5	2
Small Group	54	96	34	84	50	108	7	40	4	33	2	20
Tutoring by Student/ Volunteer Adult	<.5	2	<.5	1	<.5	1	<.5	1	<.5	2	<.5	1
Independent Study – Programmed	4	9	1	3	8	21	2	7	1	2	1	3
Independent Study	17	13	23	15	20	15	19	14	19	14	20	14
Mathematics Total Program Cost	258	147	213	136	233	119	151	85	132	70	147	94

Table C-23

Cost of Mathematics Program Components Offered to Fifth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Components	Mathematics CE Selection Category: Title I Students in Title I Schools 863 Fifth Graders		Other-CE Students in Title I Schools 481 Fifth Graders		Other-CE Students in Other-CE Schools 407 Fifth Graders		Non-CE Students in Title I Schools 6780 Fifth Graders		Non-CE Students in Other-CE Schools 3326 Fifth Graders		Non-CE Students in Non-CE Schools 1353 Fifth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	41	42	30	36	32	35	49	40	49	35	49	38
Large Group	12	28	12	28	7	26	12	28	8	21	10	23
Medium Group	37	62	32	60	36	55	25	50	18	37	19	43
Small Group	57	96	72	100	58	83	37	92	36	72	63	122
Teaching Assistant/Aide												
Small Group	17	29	4	11	12	18	2	10	2	9	1	4
Special Teacher												
Medium Group	21	38	6	16	12	42	3	20	1	9	<5	3
Small Group	70	130	28	81	32	72	6	39	2	16	3	18
Tutoring by Student/ Volunteer Adult	1	2	<5	1	1	2	<5	1	<5	1	<5	1
Independent Study – Programmed	3	8	3	9	5	11	2	7	1	4	2	5
Independent Study	14	13	18	14	18	10	17	14	19	14	18	14
Mathematics Total Program Cost	273	149	205	97	213	90	153	100	135	64	166	116

Table C-24

Cost of Mathematics Program Components Offered to Sixth Graders by Student CE Selection Categories (In Standard Resource Dollars)

Mathematics Program Components	Mathematics CE Selection Category: Title I Students in Title I Schools 698 Sixth Graders		Other-CE Students in Title I Schools 665 Sixth Graders		Other-CE Students in Other-CE Schools 427 Sixth Graders		Non-CE Students in Title I Schools 6970 Sixth Graders		Non-CE Students in Other-CE Schools 4840 Sixth Graders		Non-CE Students in Non-CE Schools 1740 Sixth Graders	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Classroom Teacher												
Whole Class	23	33	29	32	37	43	45	37	55	38	56	38
Large Group	20	37	13	26	10	32	11	26	12	29	4	21
Medium Group	31	56	27	47	24	50	18	40	22	54	22	56
Small Group	79	116	71	87	38	68	43	88	22	62	46	121
Teaching Assistant/Aide												
Small Group	15	20	4	11	12	18	2	7	1	5	<.5	2
Special Teacher												
Medium Group	23	47	6	24	18	51	1	11	3	13	5	26
Small Group	53	105	18	62	33	77	4	22	2	15	2	19
Tutoring by Student/ Volunteer Adult	1	2	<.5	2	1	2	<.5	1	<.5	1	<.5	1
Independent Study – Programmed	2	5	5	11	7	12	4	12	1	4	2	5
Independent Study	14	13	15	11	15	11	16	14	13	13	13	11
Mathematics Total Program Cost	260	140	187	90	195	83	144	87	131	65	150	126

APPENDIX D
TABLES SUPPORTING CHAPTER 4

The tables in this appendix provide the grade-by-grade data for the material presented in Chapter 4.

Table D-1

Cost of Reading Programs by CE Selection Categories and Student Achievement Level — First Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading Achievement Level	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	456	232	559	420	182	264	477	206	187	347	154	1670	357	172	589	321	133	366
Second Quarter	464	233	512	412	231	250	485	225	142	362	164	1615	358	159	610	354	157	294
Third Quarter	459	221	314	389	191	165	464	205	77	341	143	1331	344	130	580	322	142	236
Highest Quarter	462	216	282	385	165	148	443	204	137	349	156	2000	358	158	1056	334	154	409

Table D-2

Cost of Reading Programs by CE Selection Categories and Student Achievement Level — Second Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading Achievement Level	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	475	229	891	448	222	264	464	181	242	356	172	995	358	165	217	333	150	249
Second Quarter	477	251	626	429	206	254	450	190	202	339	181	1187	334	153	428	294	126	309
Third Quarter	444	210	170	347	118	152	441	171	75	331	187	1472	328	152	699	279	116	280
Highest Quarter	438	223	115	345	170	150	442	183	75	329	181	1716	311	150	1113	281	131	319

Table D-3

Cost of Reading Programs by CE Selection Categories and Student Achievement Level — Third Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading Achievement Level	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	417	185	1086	423	178	292	429	220	255	303	154	923	288	160	282	327	156	245
Second Quarter	405	171	532	377	147	170	394	162	164	276	139	1102	265	138	465	302	147	282
Third Quarter	409	189	120	314	140	112	412	222	74	257	116	1445	253	125	708	249	146	297
Highest Quarter	396	189	86	319	126	129	403	220	55	264	132	1646	245	131	1049	229	139	381

Table D-4

Cost of Reading Programs by CE Selection Categories and Student Achievement Level — Fourth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading Achievement Level	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	406	182	909	378	184	273	378	170	245	254	145	1115	240	130	353	260	161	253
Second Quarter	406	176	468	338	180	176	363	175	162	224	128	1239	218	108	503	208	113	248
Third Quarter	380	172	113	289	127	89	351	155	69	202	110	1490	207	101	707	172	82	297
Highest Quarter	318	168	72	273	116	103	307	150	39	211	118	1652	185	84	1091	185	107	379

Table D-5

Cost of Reading Programs by CE Selection Categories and Student Achievement Level — Fifth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading Achievement Level	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	365	171	972	350	159	250	337	151	295	247	156	1124	215	98	443	236	144	286
Second Quarter	331	167	367	291	148	158	305	146	165	208	113	1372	191	82	665	210	128	251
Third Quarter	259	164	88	269	126	75	304	125	52	182	93	1542	182	81	849	197	133	305
Highest Quarter	257	139	83	278	132	67	285	93	24	181	97	1682	177	81	1117	190	122	465

Table D-6

Cost of Reading Programs by CE Selection Categories and Student Achievement Level — Sixth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading Achievement Level	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	365	151	830	269	157	296	304	126	325	190	124	1215	213	114	786	219	204	375
Second Quarter	370	175	294	223	127	161	302	147	143	168	97	1333	192	111	931	195	176	355
Third Quarter	312	155	62	202	92	113	225	97	56	155	81	1656	175	100	1319	160	154	442
Highest Quarter	329	139	31	179	132	96	258	122	34	161	97	1923	171	101	1696	152	128	517

Table D-7

Cost of Mathematics Programs by CE Selection Categories and Student Achievement Level — First Grade (In Standard Resource Dollars)

Mathematics Achievement Level	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	209	105	307	160	81	152	200	78	117	148	81	1545	134	58	553	172	112	316
Second Quarter	220	99	287	164	89	231	224	112	83	138	74	1617	135	69	604	132	73	260
Third Quarter	213	93	114	140	78	142	224	116	67	137	71	1562	127	63	621	129	63	262
Highest Quarter	184	80	122	125	64	157	203	57	66	131	66	2116	123	56	1097	140	66	379

Table D-8

Cost of Mathematics Programs by CE Selection Categories and Student Achievement Level — Second Grade (In Standard Resource Dollars)

Mathematics Achievement Level	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	230	157	376	170	91	171	224	74	103	160	101	1160	135	72	273	153	100	238
Second Quarter	214	131	260	159	68	126	205	71	66	148	85	1346	132	63	519	131	66	251
Third Quarter	202	119	122	146	84	108	210	53	39	145	79	1383	133	59	657	126	56	257
Highest Quarter	192	140	80	145	100	113	211	71	56	146	84	1779	131	61	1049	129	65	306

Table D-9

Cost of Mathematics Programs by CE Selection Categories and Student Achievement Level — Third Grade (In Standard Resource Dollars)

Mathematics Achievement Level	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	247	119	553	205	116	178	247	126	130	159	102	1166	145	99	358	183	141	236
Second Quarter	247	114	242	186	96	115	223	120	102	142	74	1298	125	60	498	145	92	280
Third Quarter	232	99	91	179	68	86	199	110	47	134	64	1449	129	65	662	135	78	292
Highest Quarter	222	118	60	142	61	80	191	65	62	143	78	1670	141	79	1033	134	81	346

Table D-10

Cost of Mathematics Programs by CE Selection Categories and Student Achievement Level — Fourth Grade (In Standard Resource Dollars)

Mathematics Achievement Level	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	268	146	451	252	167	199	252	139	148	167	106	1295	144	72	484	159	93	261
Second Quarter	259	154	220	193	116	126	228	107	93	146	80	1183	134	69	453	146	86	218
Third Quarter	241	141	135	191	124	120	224	98	66	144	76	1594	129	70	733	145	97	334
Highest Quarter	248	146	59	206	96	99	189	71	40	149	81	1671	126	70	1014	140	93	319

Table D-11

Cost of Mathematics Program by CE Selection Categories and Student Achievement Level – Fifth Grade (In Standard Resource Dollars)

Mathematics Achievement Level	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	288	147	499	221	111	192	228	101	203	183	129	1443	147	73	584	186	118	293
Second Quarter	267	151	197	198	78	91	210	82	95	152	100	1393	132	60	623	167	104	261
Third Quarter	245	147	81	191	70	80	176	63	47	143	87	1577	133	62	835	168	137	308
Highest Quarter	211	115	49	191	85	85	204	85	34	139	81	1699	132	63	1074	146	96	435

Table D-12

Cost of Mathematics Programs by CE Selection Categories and Student Achievement Level – Sixth Grade (In Standard Resource Dollars)

Mathematics Achievement Level	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Lowest Quarter	274	143	362	196	115	232	200	83	204	156	98	1534	140	73	907	173	159	355
Second Quarter	262	138	180	178	80	156	192	84	121	145	90	1534	134	71	927	153	142	366
Third Quarter	238	139	83	183	71	92	198	73	42	141	83	1540	132	66	1127	148	117	405
Highest Quarter	221	126	31	180	67	99	189	91	27	133	76	1818	124	55	1544	134	96	518

Table D-13

Cost of Reading Program by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – ALL Grades (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	418	196	4874	428	212	2521	446	212	668	443	214	486
Title I Selectees – Not Needed	331	170	453	338	176	333	285	137	222	282	150	146
Other CE Selectees – Needed	395	200	1326	394	220	700	359	197	233	380	190	210
Other CE Selectees – Not Needed	327	138	357	304	142	504	287	121	506	278	132	468
Non-CE Selectee – Needed	291	170	4001	291	171	2573	280	165	1062	304	175	1239
Non-CE Selectee – Not Needed	272	151	3311	250	147	5697	236	141	8182	243	148	9296
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	387	185	1344	392	195	761	411	202	241	460	234	156
Other CE Selectee – Not Needed	384	189	225	349	160	238	323	157	180	335	141	194
Non-CE Selectee – Needed	273	161	1274	265	144	916	244	134	480	277	166	402
Non-CE Selectee – Not Needed	260	143	1469	243	140	2786	233	131	4472	232	137	6634
NON-CE SCHOOLS												
Needed	306	178	1027	285	163	596	260	179	237	262	162	213
Not Needed	248	147	792	247	150	1207	217	141	1658	218	141	2232

Table D-14

Cost of Reading Program by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – First Grade
(In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	473	237	461	478	237	440	494	226	245	489	219	226
Title I Selectees – Not Needed	389	185	111	370	183	80	342	148	72	355	172	50
Other CE Selectees – Needed	468	215	144	514	278	119	451	235	73	435	202	59
Other CE Selectees – Not Needed	361	113	126	321	118	132	342	128	95	355	125	89
Non-CE Selectee – Needed	346	174	603	374	193	508	359	172	282	353	193	398
Non-CE Selectee – Not Needed	347	141	1086	355	149	1134	336	134	1064	346	144	1575
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	460	187	143	497	229	94	472	182	46	516	226	56
Other CE Selectee – Not Needed	539	248	45	471	225	44	461	227	35	384	163	71
Non-CE Selectee – Needed	384	215	149	366	163	131	356	141	69	383	191	110
Non-CE Selectee – Not Needed	346	154	448	355	157	485	344	129	506	357	154	928
NON-CE SCHOOLS												
Needed	323	149	121	385	168	93	341	151	43	346	195	55
Not Needed	321	123	247	340	149	202	319	140	192	329	141	339

Table D-15

Cost of Reading Program by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – Second Grade (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	478	232	843	483	255	569	475	214	138	451	229	91
Title I Selectees – Not Needed	413	157	64	401	181	63	309	118	34	343	151	22
Other CE Selectees – Needed	453	227	239	446	219	191	397	141	51	401	220	48
Other CE Selectees – Not Needed	400	149	28	377	151	70	323	94	105	317	136	106
Non-CE Selectee – Needed	368	173	650	359	183	433	345	187	165	350	179	199
Non-CE Selectee – Not Needed	335	166	368	328	176	799	329	186	1363	327	183	1502
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	465	189	210	469	202	161	478	189	52	557	224	28
Other CE Selectee – Not Needed	431	132	37	371	103	46	358	70	26	371	116	40
Non-CE Selectee – Needed	379	176	114	347	163	107	345	162	49	342	174	43
Non-CE Selectee – Not Needed	334	147	107	329	148	321	326	151	656	309	149	1054
NON-CE SCHOOLS												
Needed	357	156	176	324	131	109	281	163	32	243	129	43
Not Needed	278	116	76	280	121	201	279	109	251	287	131	269

Table D-16

Cost of Reading Program by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – Third Grade (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	422	185	1039	416	173	489	456	173	100	442	208	55
Title I Selectees – Not Needed	316	157	68	330	178	58	240	118	31	286	84	25
Other CE Selectees – Needed	442	185	236	410	163	96	364	184	31	364	146	35
Other CE Selectees – Not Needed	353	126	61	338	117	83	295	116	89	294	105	91
Non-CE Selectee – Needed	314	164	598	303	149	392	300	134	132	320	157	171
Non-CE Selectee – Not Needed	277	127	368	260	127	788	255	115	1366	260	128	1448
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	440	224	215	418	157	125	496	240	43	498	314	21
Other Ce Selectee – Not Needed	372	187	39	295	144	41	289	118	34	339	100	32
Non-CE Selectee – Needed	322	176	144	297	147	135	238	126	58	255	147	51
Non-CE Selectee – Not Needed	259	151	139	252	132	343	253	124	664	245	130	998
NON-CE SCHOOLS												
Needed	350	164	185	326	159	122	295	178	31	285	161	43
Not Needed	269	132	65	280	133	176	246	142	272	223	133	346

Table D-17

Cost of Reading Program by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – Fourth Grade (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	422	181	832	419	178	423	397	179	88	379	174	45
Title I Selectees – Not Needed	269	125	84	313	131	54	301	128	30	185	75	23
Other CE Selectees – Needed	391	188	242	353	193	104	243	133	27	305	154	29
Other CE Selectees – Not Needed	326	147	51	316	160	85	291	124	71	258	97	73
Non-CE Selectee – Needed	268	151	701	260	145	401	243	134	154	286	153	157
Non-CE Selectee – Not Needed	230	135	461	207	113	901	199	107	1391	203	112	1478
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	380	176	220	374	193	127	375	189	36	366	168	18
Other CE Selectee – Not Needed	332	118	31	318	88	41	317	107	35	256	108	24
Non-CE Selectee – Needed	260	137	195	246	109	143	223	108	83	230	119	65
Non-CE Selectee – Not Needed	214	115	164	209	106	370	205	103	650	183	83	1015
NON-CE SCHOOLS												
Needed	293	173	155	229	103	99	227	149	39	225	138	29
Not Needed	209	117	110	192	113	162	167	76	266	180	104	346

Table D-18

Cost of Reading Program by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – Fifth Grade (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	371	170	913	339	162	323	292	179	55	309	145	49
Title I Selectees – Not Needed	279	177	64	278	174	54	203	120	33	141	57	20
Other CE Selectees – Needed	358	158	226	313	152	94	280	136	23	347	134	23
Other CE Selectees – Not Needed	279	137	28	259	136	65	263	120	55	240	117	43
Non-CE Selectee – Needed	261	172	767	240	133	421	204	123	171	223	117	169
Non-CE Selectee – Not Needed	211	113	416	197	102	1047	180	91	1432	177	94	1507
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	337	155	272	296	144	139	291	119	37	320	117	14
Other CE Selectee – Not Needed	329	128	26	327	151	37	299	127	21	254	63	12
Non-CE Selectee – Needed	222	105	263	205	90	146	205	102	62	210	105	49
Non-CE Selectee – Not Needed	200	85	197	186	79	544	181	79	803	177	81	1053
NON-CE SCHOOLS												
Needed	262	158	181	237	161	55	256	198	30	189	113	23
Not Needed	205	113	116	207	119	212	198	135	285	189	122	441

Table D-19

Cost of Reading Program by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services -- Sixth Grade (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees -- Needed	368	150	786	377	175	277	344	171	42	371	151	20
Title I Selectees -- Not Needed	296	150	62	277	167	24	233	94	22	284	82	6
Other CE Selectees -- Needed	284	164	239	251	139	96	222	126	28	323	204	16
Other CE Selectees -- Not Needed	221	125	63	185	93	69	194	82	91	137	83	66
Non-CE Selectee -- Needed	206	127	682	190	120	418	175	102	158	198	124	145
Non-CE Selectee -- Not Needed	170	114	612	159	83	1028	154	80	1566	158	93	1786
OTHER-CE SCHOOLS												
Other CE Selectee -- Needed	307	127	284	308	152	115	257	114	27	300	134	19
Other CE Selectee -- Not Needed	274	119	47	282	130	29	192	69	29	184	52	15
Non-CE Selectee -- Needed	226	128	409	207	115	254	193	101	159	193	101	84
Non-CE Selectee -- Not Needed	196	97	414	185	110	723	173	101	1193	166	99	1586
NON-CE SCHOOLS												
Needed	260	219	209	197	163	118	200	193	62	162	96	20
Not Needed	179	177	178	192	175	254	156	148	392	153	131	491

Table D-20

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services -- ALL Grades
(In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees -- Needed	259	141	2416	250	133	1262	238	129	556	225	127	289
Title I Selectees -- Not Needed	189	106	245	180	100	225	169	95	138	160	85	115
Other CE Selectees -- Needed	210	125	971	186	93	622	177	96	307	181	96	232
Other CE Selectees -- Not Needed	169	96	284	157	78	364	158	80	418	150	74	437
Non-CE Selectee -- Needed	167	105	5725	150	87	3920	152	85	2057	159	100	1648
Non-CE Selectee -- Not Needed	150	94	3784	140	80	6001	138	75	8056	136	72	9370
OTHER-CE SCHOOLS												
Other CE Selectee -- Needed	223	107	791	211	102	455	220	111	177	205	86	93
Other CE Selectee -- Not Needed	216	90	168	199	77	162	196	68	158	191	60	189
Non-CE Selectee -- Needed	148	79	1663	140	72	1159	137	68	717	138	65	544
Non-CE Selectee -- Not Needed	133	66	1892	129	63	2867	130	64	4273	128	64	6366
NON-CE SCHOOLS												
Needed	186	140	958	169	118	574	155	110	314	152	98	242
Not Needed	155	100	906	136	89	1222	140	96	1661	136	84	2100

Table D-21

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – First Grade (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	208	105	284	225	103	249	208	92	111	188	84	94
Title I Selectees – Not Needed	186	106	38	179	69	57	187	85	22	165	61	33
Other CE Selectees – Needed	179	83	109	178	85	131	162	82	72	155	68	59
Other CE Selectees – Not Needed	135	77	60	148	85	120	120	62	88	111	55	108
Non-CE Selectee – Needed	153	82	850	146	78	720	154	87	449	146	86	445
Non-CE Selectee – Not Needed	142	79	899	133	70	1156	133	66	1281	128	63	1761
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	189	75	94	216	125	62	244	157	38	201	90	17
Other CE Selectee – Not Needed	233	82	29	217	71	26	204	62	36	197	42	44
Non-CE Selectee – Needed	141	67	188	144	79	175	138	80	103	132	61	130
Non-CE Selectee – Not Needed	131	53	402	131	63	480	125	59	550	122	55	996
NON-CE SCHOOLS												
Needed	180	131	122	130	79	71	130	70	73	135	69	46
Not Needed	166	95	220	135	70	210	131	62	211	140	62	339

Table D-22

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – Second Grade
(In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	234	158	361	219	136	229	202	117	105	205	152	68
Title I Selectees – Not Needed	143	53	40	174	83	46	177	116	25	146	43	16
Other CE Selectees – Needed	172	84	163	160	73	128	155	70	63	176	114	59
Other CE Selectees – Not Needed	140	112	26	122	45	26	134	86	68	128	73	78
Non-CE Selectee – Needed	162	102	901	146	84	729	147	76	424	156	103	377
Non-CE Selectee – Not Needed	144	86	514	143	80	968	141	76	1223	142	74	1528
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	221	77	89	205	73	60	231	50	25	197	69	19
Other CE Selectee – Not Needed	215	65	23	183	64	21	198	54	25	219	74	37
Non-CE Selectee – Needed	138	75	177	141	68	187	146	61	117	142	65	100
Non-CE Selectee – Not Needed	127	63	158	127	58	423	132	59	621	131	60	985
NON-CE SCHOOLS												
Needed	169	114	155	151	83	109	140	68	42	138	74	54
Not Needed	131	67	111	123	56	188	123	53	232	129	66	266

Table D-23

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services -- Third Grade (In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees -- Needed	245	119	552	254	117	221	242	107	82	243	129	43
Title I Selectees -- Not Needed	183	83	33	180	58	35	203	59	19	175	80	14
Other CE Selectees -- Needed	201	121	149	196	104	80	187	86	42	155	79	31
Other CE Selectees -- Not Needed	190	82	62	157	64	58	159	50	60	135	47	49
Non-CE Selectee -- Needed	160	102	1043	144	80	653	142	94	252	176	116	247
Non-CE Selectee -- Not Needed	143	76	412	139	69	970	132	61	1345	138	70	1438
OTHER-CE SCHOOLS												
Other CE Selectee -- Needed	245	123	122	237	123	78	242	138	24	215	77	17
Other CE Selectee -- Not Needed	190	107	20	165	68	41	163	52	27	178	59	43
Non-CE Selectee -- Needed	158	95	250	140	76	152	124	54	96	139	73	70
Non-CE Selectee -- Not Needed	124	89	174	122	52	399	129	66	619	141	80	983
NON-CE SCHOOLS												
Needed	199	150	182	173	105	113	171	89	38	157	81	51
Not Needed	136	90	80	128	74	193	129	74	272	129	75	303

Table D-24

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services -- Fourth Grade
(In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	277	149	410	265	154	214	269	148	110	294	144	36
Title I Selectees – Not Needed	208	124	54	202	127	33	155	75	36	178	118	24
Other CE Selectees – Needed	255	172	181	196	121	100	202	146	61	210	122	32
Other CE Selectees – Not Needed	212	114	44	178	100	56	180	105	74	211	83	69
Non-CE Selectee – Needed	169	106	909	160	87	577	154	77	372	168	100	199
Non-CE Selectee – Not Needed	157	96	606	138	71	806	141	74	1399	146	76	1480
OTHER CE SCHOOLS												
Other CE Selectee – Needed	252	147	122	214	115	71	224	110	33	222	78	10
Other CE Selectee – Not Needed	253	111	33	266	71	23	228	84	33	177	67	30
Non-CE Selectee – Needed	148	69	280	150	79	177	138	57	124	137	64	78
Non-CE Selectee – Not Needed	137	68	271	127	67	329	128	71	667	125	70	937
NON-CE SCHOOLS												
Needed	179	112	144	168	122	88	157	125	65	180	145	35
Not Needed	139	70	151	131	47	157	140	86	299	136	92	289

Table D-25

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – Fifth Grade
(In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	295	147	465	277	148	180	253	155	80	246	113	30
Title I Selectees – Not Needed	201	121	45	215	174	26	163	141	15	149	109	16
Other CE Selectees – Needed	229	115	175	201	83	68	185	68	29	249	77	24
Other CE Selectees – Not Needed	188	127	28	184	65	30	188	71	62	167	75	60
Non-CE Selectee – Needed	185	131	1074	159	105	652	165	101	272	155	89	221
Non-CE Selectee – Not Needed	172	116	570	146	93	984	141	85	1448	136	79	1498
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	230	101	181	208	84	82	171	53	36	214	108	17
Other CE Selectee – Not Needed	210	90	29	200	67	22	193	77	14	192	51	19
Non-CE Selectee – Needed	155	78	331	141	65	183	138	75	98	155	81	60
Non-CE Selectee – Not Needed	139	65	322	130	58	499	132	59	784	131	63	1014
NON-CE SCHOOLS												
Needed	207	133	161	203	126	76	202	172	31	162	104	21
Not Needed	172	109	151	157	96	204	165	132	286	144	96	413

Table D-26

Cost of Mathematics Programs by Student Achievement Level, CE Selection Categories and Teacher Judgment of Need for CE Services – Sixth Grade
(In Standard Resource Dollars)

School/Student CE Selection Category	Achievement Quarter											
	Lowest			Second			Third			Highest		
Teacher Judgment of Need for CE	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
TITLE I SCHOOLS												
Title I Selectees – Needed	278	144	344	275	134	169	267	136	68	273	129	18
Title I Selectees – Not Needed	210	110	35	137	81	28	137	86	21	131	76	12
Other CE Selectees – Needed	207	119	194	199	85	115	187	75	40	183	73	27
Other CE Selectees – Not Needed	155	68	64	158	65	74	178	64	66	169	52	73
Non-CE Selectee – Needed	167	96	948	150	88	589	150	80	288	171	111	159
Non-CE Selectee – Not Needed	146	100	783	142	90	1117	139	84	1360	130	71	1665
OTHER-CE SCHOOLS												
Other CE Selectee – Needed	199	84	183	193	86	102	216	83	21	181	97	13
Other CE Selectee – Not Needed	186	67	34	188	83	29	179	57	23	165	43	16
Non-CE Selectee – Needed	146	82	437	132	68	285	137	75	179	130	55	106
Non-CE Selectee – Not Needed	134	66	565	133	71	737	131	65	1032	123	54	1451
NON-CE SCHOOLS												
Needed	178	173	194	183	158	117	160	119	65	154	123	35
Not Needed	161	131	193	140	132	270	146	116	361	133	93	490

Table D-27

Reading Program Cost by CE Selection Categories and Student Minority Status — First Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	382	196	719	395	150	322	424	167	178	314	158	1760	346	144	460	328	148	377
Non-Minority	522	232	935	412	223	501	495	228	345	363	152	4779	358	159	2339	336	145	901

Table D-28

Reading Program Cost by CE Selection Categories and Student Minority Status — Second Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	455	216	682	394	164	343	396	169	182	347	173	1495	318	137	287	306	138	312
Non-Minority	479	245	1113	414	219	469	481	184	405	334	185	3807	324	155	2134	291	130	833

Table D-29

Reading Program Cost by CE Selection Categories and Student Minority Status — Third Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	398	171	796	380	131	328	408	212	178	288	140	1308	301	169	336	337	167	262
Non-Minority	423	189	1013	372	186	368	416	202	364	267	132	3712	249	127	2143	253	141	935

Table D-30

Reading Program Cost by CE Selection Categories and Student Minority Status — Fourth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	409	178	703	339	177	229	331	124	222	253	143	1496	237	124	461	262	143	252
Non-Minority	396	182	836	340	168	404	389	193	291	207	116	3922	198	96	2152	186	109	914

Table D-31

Reading Program Cost by CE Selection Categories and Student Minority Status — Fifth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	358	161	737	346	156	224	326	141	231	249	157	1601	212	94	574	220	135	292
Non-Minority	334	182	755	291	146	324	320	151	298	182	90	4068	181	82	2470	202	131	1005

Table D-32

Reading Program Cost by CE Selection Categories and Student Minority Status — Sixth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	378	144	641	287	168	249	302	110	248	207	121	1432	226	123	717	277	234	289
Non-Minority	346	169	570	201	112	401	285	146	304	154	88	4645	174	100	3962	157	138	1384

Table D-33

Mathematics Program Cost by CE Selection Categories and Student Minority Status — First Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	211	101	541	169	65	283	235	113	141	143	78	1779	134	61	462	153	111	350
Non-Minority	207	94	285	135	89	394	189	69	177	136	71	4972	127	61	2373	142	67	840

Table D-34

Mathematics Program Cost by CE Selection Categories and Student Minority Status — Second Grade (In Standard Resource Dollars)

	Mathematics CE Selection Status																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	234	163	465	164	64	239	227	56	113	155	97	1559	153	84	314	149	101	269
Non-Minority	197	111	368	151	103	275	206	79	147	147	82	4035	129	58	2145	130	61	771

Table D-35

Mathematics Program Cost by CE Selection Categories and Student Minority Status — Third Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	249	122	609	178	76	170	267	136	124	158	100	1482	164	105	359	187	129	256
Non-Minority	235	105	324	189	109	281	196	88	211	139	71	4001	131	69	2165	135	85	890

Table D-36

Mathematics Program Cost by CE Selection Categories and Student Minority Status — Fourth Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	285	150	515	160	101	166	223	111	178	168	105	1571	140	70	458	178	103	236
Non-Minority	226	137	331	243	145	373	243	125	167	144	77	4083	130	70	2185	138	89	883

Table D-37

Mathematics Program Cost by CE Selection Categories and Student Minority Status — Fifth Grade (In Standard Resource Dollars)

	Mathematics CE Selection Categories																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	301	134	494	223	98	167	231	97	185	179	127	1810	161	87	581	183	116	297
Non-Minority	235	159	326	194	91	276	200	86	187	142	86	4241	129	56	2500	159	113	990

Table D-38

Mathematics Program Cost by CE Selection Categories and Student Minority Status — Sixth Grade (In Standard Resource Dollars)

	Mathematics CE Selection Categories																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Minority	296	134	364	190	120	187	208	69	198	156	99	1642	142	68	711	254	216	286
Non-Minority	223	140	289	182	76	380	183	90	190	139	82	4723	129	64	3746	129	86	1343

Table D-39

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — First Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	483	226	580	401	213	325	474	224	311	354	150	4120	357	158	2211	336	144	899
Participate	449	228	1074	409	187	498	465	193	212	343	162	2419	353	149	588	328	150	379

Table D-40

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — Second Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	477	248	747	407	199	347	480	188	360	332	188	3312	326	157	2004	288	131	776
Participate	465	225	1048	405	196	465	415	170	227	347	170	1990	315	135	417	309	135	369

Table D-41

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program – Third Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	419	188	677	366	183	243	421	211	307	266	126	3159	254	134	1998	256	139	880
Participate	408	178	1132	381	150	453	403	197	235	282	146	1861	267	139	481	314	174	317

Table D-42

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program – Fourth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	400	174	548	319	143	244	383	198	269	208	114	3331	196	94	2064	187	104	868
Participate	403	183	991	353	185	389	343	128	244	239	140	2087	241	124	549	247	152	298

Table D-43

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — Fifth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	314	164	504	270	149	210	322	151	261	184	97	3430	180	79	2366	202	132	961
Participate	363	174	988	341	148	338	323	143	268	227	138	2239	213	99	678	218	132	336

Table D-44

Reading Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — Sixth Grade (In Standard Resource Dollars)

	Reading CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Reading	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	329	154	383	203	117	289	298	145	283	155	87	4047	178	106	3818	170	165	1334
Participate	379	156	828	259	155	361	286	115	269	191	117	2030	200	105	861	209	163	339

Table D-45

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Priced Lunch or Breakfast Program — First Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	204	95	186	130	85	291	192	74	180	131	68	4168	128	61	2242	147	77	843
Participate	211	100	640	164	75	386	232	111	138	149	80	2583	132	62	593	139	93	347

Table D-46

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — Second Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	197	110	283	153	100	185	210	75	135	141	72	3442	131	60	2017	130	64	712
Participate	229	157	550	159	79	329	220	65	125	162	104	2152	139	72	442	144	91	328

Table D-47

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program – Third Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	234	118	256	179	87	205	199	93	189	137	66	3306	134	78	2016	138	76	839
Participate	248	115	677	190	106	246	251	131	146	155	96	2177	139	68	508	169	142	307

Table D-48

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program – Fourth Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	227	144	234	237	123	236	236	111	166	145	75	3376	129	71	2081	140	81	837
Participate	275	147	612	202	147	303	229	125	179	160	100	2278	142	66	562	167	120	282

Table D-49

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — Fifth Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	218	137	226	188	78	193	200	83	165	143	89	3536	134	65	2388	162	114	956
Participate	297	146	594	219	103	250	227	99	207	167	115	2515	138	62	693	170	116	331

Table D-50

Mathematics Program Cost by CE Selection Categories and Student Participation in Free or Reduced Price Lunch or Breakfast Program — Sixth Grade (In Standard Resource Dollars)

	Mathematics CE Selection Category																	
	Title I Students in Title I Schools			Other-CE Students in Title I Schools			Other-CE Students in Other-CE Schools			Non-CE Students in Title I Schools			Non-CE Students in Other-CE Schools			Non-CE Students in Non-CE Schools		
Mathematics	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Do Not Participate	217	137	192	186	75	266	185	88	170	137	81	4083	129	65	3603	146	128	1298
Participate	283	138	461	184	106	301	204	75	218	154	96	2282	139	67	854	170	128	331